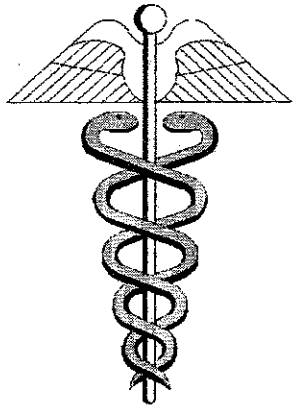
2003

Department of Veterinary and Biomedical Sciences: VBMS Annual Report 2003

Department of Veterinary and Biomedical Sciences

VBMS Annual Report 2003

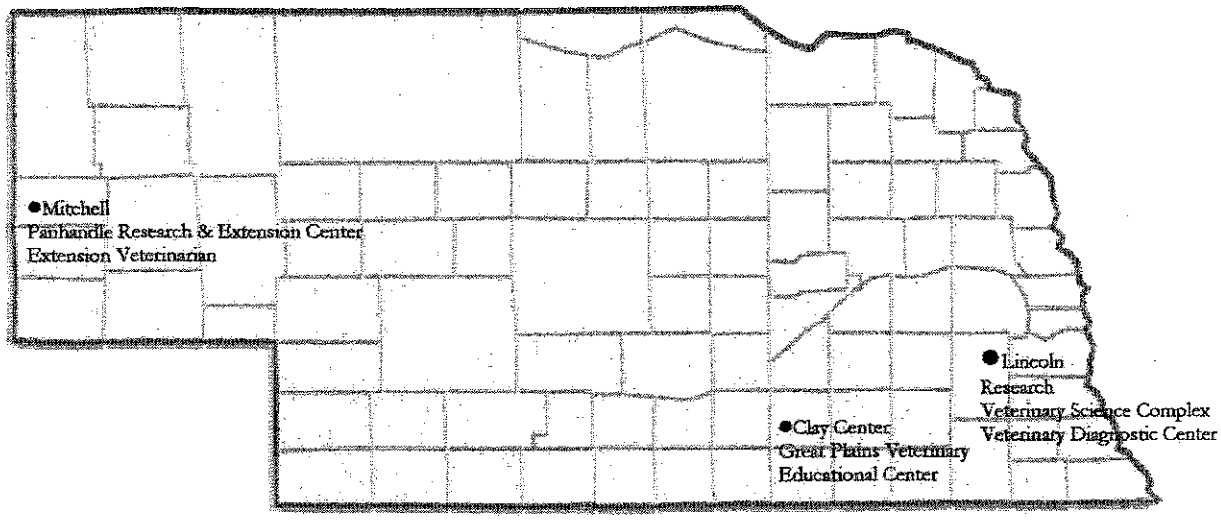


University of Nebraska-Lincoln
Institute of Agricultural and Natural Resources

● Department of Veterinary and Biomedical Sciences ●
2003 Annual Report

Teaching, Research, Extension, Scholarly Service and Diagnostic

January 1, 2003 - December 31, 2003



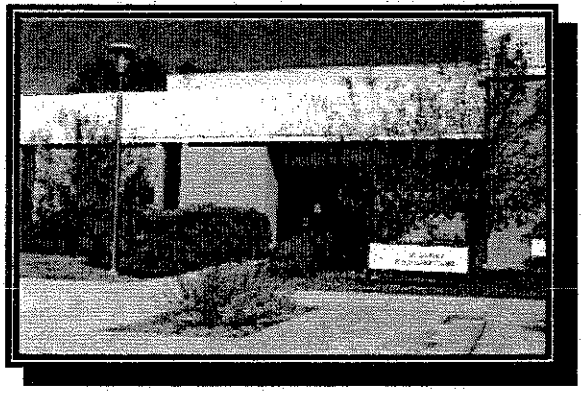
University of Nebraska-Lincoln
Institute of Agriculture and Natural Resources

IANR

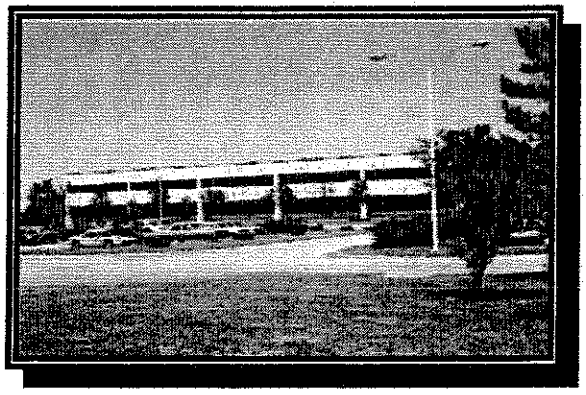
● Facilities ●

Department of Veterinary and Biomedical Sciences

Veterinary Basic Science, Lincoln, NE

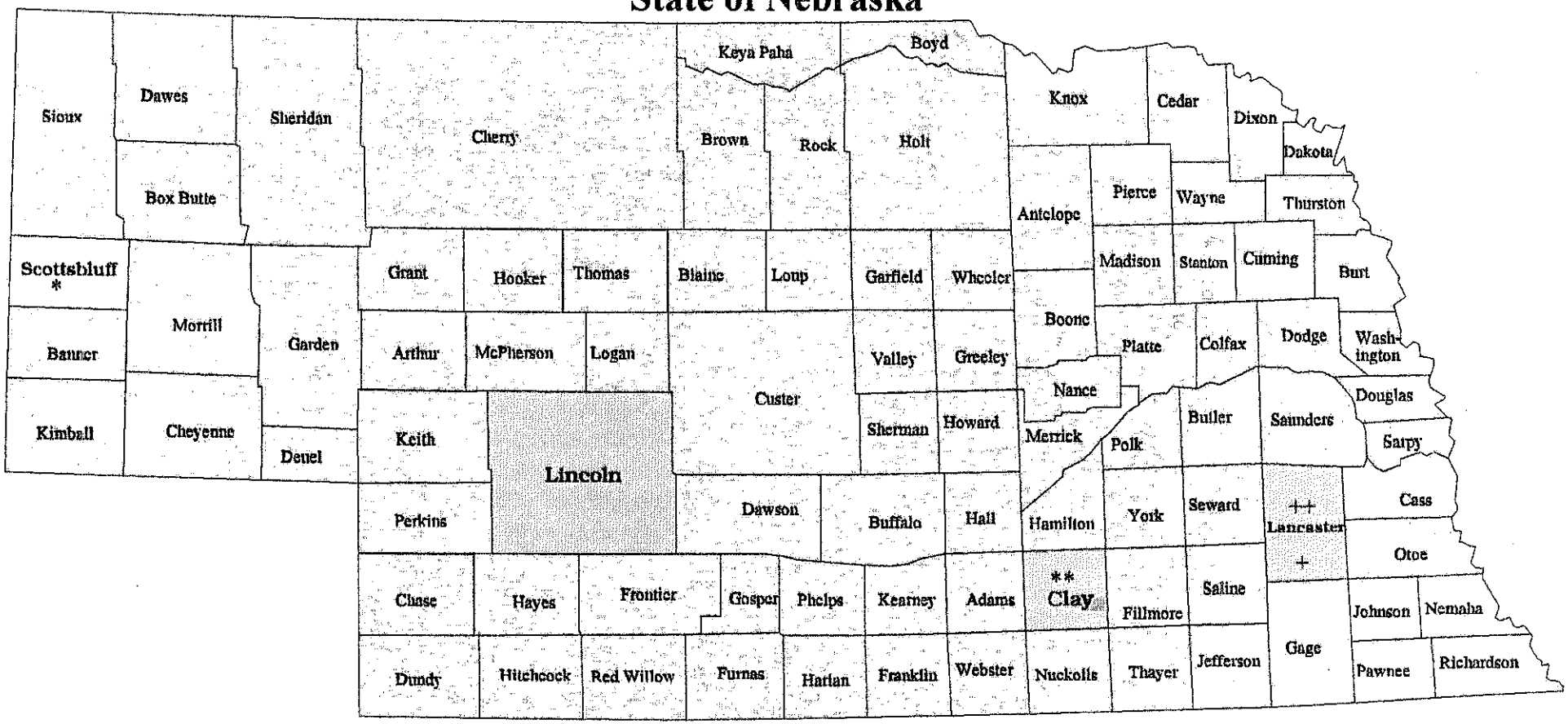


Veterinary Diagnostic Center
Lincoln, NE



Great Plains Veterinary Educational Center
Clay Center, NE

State of Nebraska



* Panhandle Research & Extension Center, Scottsbluff, NE

** Great Plains Veterinary Educational Center, Clay Center, NE

\+ Veterinary Science Complex, (Veterinary Basic Sciences, Veterinary Diagnostic Center, Animal Research Facility, Sewage Sterilization Plant and Animal Holding Facility)

++ UNL Agricultural Research and Extension Center, Mead, NE (VBMS Beef Cattle Herd)

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FOREWORD 2003

Department of Veterinary and Biomedical Sciences
John A. Schmitz, DVM, PhD
Professor and Department Head

The PhD program in Integrative Biomedical Sciences (IBMS) was approved by the UN Board of Regents in January 2003, thus providing the VBMS Department with a PhD degree program at UNL. While this is an interdepartmental program, the VBMS Department will provide administrative support. All but two departmental PhD students previously enrolled in the UNMC MSIA graduate program transferred into the new IBMS program, thus providing a substantial immediate enrollment in the program. The UN Graduate College merged its Graduate College Member and Fellow category, and henceforth, all Graduate College members can advise PhD students and serve on PhD graduate supervisory committees.

Budget reductions for the University of Nebraska resulted in cancellation of the Veterinary Student Contract Program with Kansas State University College of Veterinary Medicine (KSU CVM). Nebraska residents already participating in the program will be supported through the completion of their degrees, using internal IANR funds. A special Legislative Bill provided funding for the 2003-2005 biennium so that new students admitted in August 2003 and August 2004, will also be supported at KSU through completion of their veterinary medical degrees. A new Appropriations Bill must be passed by the Legislature in 2005 to support any future veterinary student contract program. A Veterinary Student Contract Program Task Force, with Steve Waller, Dean for the College of Agricultural Sciences and Natural Resources, was appointed to provide recommendations for a future contract program.

A significant decline in undergraduate enrollment in the Veterinary Science and Pre-Veterinary majors occurred in Fall Semester 2003 and was attributed to primarily to the negative publicity associated with UNL's cancellation of the Veterinary Student Contract Program. With the retirement of Dr. Schneider, Dr. Dave Steffen accepted the position of Faculty Coordinator for undergraduate student advising, recruitment and retention activities. Ms. Lee Johnson was promoted to Staff Assistant in recognition for new responsibilities that she will assume in support of undergraduate advising, recruitment and retention. Dr. Carlson also accepted some responsibilities in this area. Additionally, Drs. Bruce Brodersen, Clayton Kelling and Rod Moxley assumed formal undergraduate advising roles.

Due to budget reductions the department was unable to fill the Swine Extension Veterinarian, the Veterinary Epidemiologist (GPVEC) and the non-tenure track Beef Cattle Veterinarian (GPVEC) positions vacated in 2002, as well as the Avian Extension Veterinarian position vacated by Dr. Grasso Ebako during 2003. A managerial/professional position in the Animal Science Department, was funded by Elbert Dickey, Extension Director, to conduct

poultry disease surveillance. The Diagnostic Toxicologist faculty position vacated by Dr. Norm Schneider in December 2002 was lost, but Dr. Michael Carlson was appointed to a Lecturer position and will teach VBMS 410 General Pharmacology and Toxicology as well as manage the toxicology section in the Veterinary Diagnostic Center (VDC).

Dr. Susanne Hinkley, DVM, MS, PhD was appointed to the tenure-track VDC Diagnostic Bacteriologist faculty position.

Dr. Ruben Donis resigned his position effective December 2003, to accept a position at the Center for Disease Control and Prevention in Atlanta, GA.

Dr. Schmitz announced his decision to step down from the VBMS Department Head position effective June 30, 2004. The IANR Administrative Council appointed a search committee and initiated a national search for a new Department Head.

A biomedical research facilities grant proposal to the NIH was approved for remodeling VBS 145 & 151 into a research laboratory and office for a new VBMS faculty position. The latter will be supported by the Redox Biology Center COBRE grant for three years; whereupon, responsibility for support for this position will transfer to the IANR and VBMS Department. The UNL Biosafety Committee rejected a proposal for establishing a small BSL-3 research laboratory in the VBS building, leaving the VBMS faculty without any access to such a facility.

With an income of $420,639 per research FTE in 2003, the VBMS Department ranked second highest in extramural research grant and contract funding among all 18 administrative units in the IANR.

Dr. Don Hudson, Emeritus Associate Professor, VBMS, died unexpectedly in 2003. Dr. Hudson served as Extension Veterinarian at the West Central Research and Extension Center at North Platte, NE for about 20 years before his retirement. Don was well known, well liked and highly respected, both locally and nationally. Our condolences go out to his wife, LaVonne.

● VETERINARY AND BIOMEDICAL SCIENCES FACULTY ●

Faculty

Barletta, Raúl G.,* BS, MS, PhD ..... Associate Professor
Brodersen, Bruce W.*, BS, DVM, MS, PhD ..... Research Assistant Professor
Carlson, Michael P.,[1] BS, MS, PhD ..... Lecturer
Cirillo, Jeffrey D.*, BA, PhD, MS ..... Associate Professor
Delhon, Gustavo A., PhD, MSc, DVM ..... Research Assistant Professor
Donis, Ruben O.[2],* MV, PhD ..... Professor
Doster, Alan R.,* DVM, MS, PhD, ACVP ..... Professor
Duhamel, Gerald E.,* BS, DMV, PhD, ACVP ..... Professor
Ebako, Grasso M.[2], BS, MS, MS, DVM, MVPM ..... Lecturer
Griffin, D. Dee,* BS, DVM, MS ..... Professor
Hinkley, Susanne[1]* DVM, MS, PhD ..... Assistant Professor
Jones, Clinton J.,* BA, PhD ..... Professor
Kelling, Clayton L.,* BS, MS, PhD, DVM ..... Professor
Liang, Delin,[2] BS, MSc, PhD ..... Research Assistant Professor
Lou, Marjorie F.,* BS, MS, PhD ..... Professor
Moxley, Rodney A.,* DVM, PhD ..... Professor
Osorio, Fernando A.,* MV, MS, PhD, ACVM ..... Professor
Pattnaik, Asit K.*, BS, MS, PhD ..... Associate Professor
Paul, Prem S.*, BVSc, PhD ..... Professor, Vice Chancellor for Research, UNL
Rogers, Douglas G.,* BS, DVM, MS, PhD ..... Professor
Rupp, Gary P.,* DVM, MS ..... Professor
Schmitz, John A.,* DVM, PhD, ACVP ..... Professor and Head
Smith, David R.,* BS, DVM, PhD, ACVPM, ABVP ..... Associate Professor
Srikumaran, Subramaniam,* BVSc, MS, PhD ..... Professor
Steffen, David J.,* BS, DVM, PhD, ABVP ..... Associate Professor
Zhang, Yange, BS, MS, PhD ..... Research Assistant Professor
Zhou, Joe Y.,* BSc, PhD ..... Research Associate Professor

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[1] Appointment Began in 2003 *Graduate Faculty
[2] Appointment Ended in 2003

Postdoctoral Research Associates

Das, Subash C., BSVc, MVSc, PhD ..... Postdoctoral Research Associate
Fernando, M. Rohan[2], BS, MSc, PhD, M.Phil ..... Postdoctoral Research Associate
Inman, Melissa[2], BS, MS, PhD ..... Postdoctoral Research Associate
Jaroni, Divya, BS, MS, PhD ..... Postdoctoral Research Associate
Liu, Shuanghu, BS, MD, PhD ..... Postdoctoral Research Associate
Moon, Sungchur[2], MD, PhD ..... Postdoctoral Research Associate
Pandey, Amit Kumar[1], BVSc, Msc, PhD ..... Postdoctoral Research Associate
Peng, Weiping, BS, MS, PhD ..... Postdoctoral Research Associate
Subbian, Selvakumar[1], BS, MS, PhD ..... Postdoctoral Research Associate
Xing, Kuiyi, BS, PhD ..... Postdoctoral Research Associate
Yegorova, Svetlana P.[2], BS, MS, PhD ..... Postdoctoral Research Associate
Zhang, Wei[2], MD ..... Postdoctoral Research Associate

Adjunct and Courtesy Faculty

Campos, Manuel *, DVM, MS, PhD ..... Adjunct Associate Professor
Chenoweth, Peter J.,* BVSc, PhD ..... Adjunct Professor
DeGroff, Terry, DVM ..... Adjunct Assistant Professor
Dewey, Catherine*, DVM, MS, PhD ..... Adjunct Assistant Professor
Fajt, Virginia R., DVM, PhD ..... Adjunct Instructor
Hesse, Richard*, BA, MS, PhD ..... Adjunct Assistant Professor
Hodgson, Clague P., BSc, PhD ..... Adjunct Associate Professor
Hungerford, Laura L.*, BS, DVM, PhH, PhD ..... Adjunct Associate Professor
Hunsaker, Beck D.,* BS, DVM, MS, PhD ..... Adjunct Assistant Professor
Kador, Peter*, BA, PhD ..... Adjunct Professor
Keen, James Edward, BS, BS, DVM, PhD ..... Adjunct Associate Professor
Laegreid, William, BS, MS, DVM, PhD ..... Adjunct Associate Professor
Larson, Robert L., BS, DVM, PhD ..... Adjunct Assistant Professor
Lechtenberg, Kelly F.*, BS, DVM, PhD ..... Adjunct Assistant Professor
Loskutoff, Nadia, BS, MS, PhD ..... Adjunct Assistant Professor
Perino, Louis*, BS, DVM, PhD ..... Adjunct Associate Professor
Petro, Thomas,* BS, MA, PhD ..... Courtesy Professor
Pierce, Vern L., PhD, MS, MS, BS ..... Adjunct Assistant Professor
Rock, Daniel*, BSE, PhD ..... Adjunct Associate Professor
Ross, Gary, BS, DVM ..... Adjunct Assistant Professor
Sanderson, Michael, BS, DVM, MS ..... Adjunct Associate Professor
Sargeant, Janice Merrill , DVM, MSc, PhD ..... Adjunct Assistant Professor
Sherman, Gary B., BS, MS, DVM, PhD ..... Adjunct Courtesy Professor
Solheim, Joyce C., BS, MA, PhD ..... Courtesy Assistant Professor
Spire, Mark F.,* BS, DVM, MS ..... Adjunct Professor
Spitzer, John C., BS, MS, PhD ..... Adjunct Professor
Straw, Barbara E.*, DVM, PhD ..... Adjunct Professor
Wach, Ricky Sue B., BA, DVM, MA ..... Courtesy Instructor
Wittum, Thomas*, BS, MS, PhD ..... Adjunct Assistant Professor
Wood, Charles*, BA, MA, MPhil, PhD ..... Courtesy Professor
Wylie, Dwane*, BA, PhD ..... Courtesy Professor
Zimmerman, Jeffrey J., BA, DVM, MS, PhD ..... Adjunct Associate Professor

Emeriti Faculty

Dickinson, Earl,* BS, DVM, PhD ..... Professor Emeritus
Erickson, E. Denis*, DVM, PhD, ACVM ..... Professor Emeritus

Frey, Merwin,* BS, DVM, MS, PhD ..... Professor Emeritus
Hogg, Alex,* DVM, MS ..... Professor Emeritus
Johnson, Jerre L.,* BS, DVM, PhD ..... Professor Emeritus
Rhodes, Marvin,* BS, MS ..... Professor Emeritus
Rice, Duane, BS, DVM ..... Professor Emeritus
White, R. Gene,* BS, DVM, MS ..... Professor Emeritus

VBMS Faculty and Staff, by Function and Unit

VBMS Department Administration

- ■John A. Schmitz, DVM, PhD ..... Professor and Department Head
- Albrecht, Roxann ..... Accounting Clerk III
- Gellatly, Rene, BS ..... Administrative Team Manager
- Haahr, Patricia ..... Accounting Clerk II
- Johnson, Lilo[1] ..... Staff Assistant
- Martinez, Patsy, AA ..... Departmental Staff Secretary III

VBMS Animal Care Program

- ■John A. Schmitz, DVM, PhD ..... Faculty Supervisor
- ■Clowser, Blaine, BS* ..... Animal Operation's Manager

VBMS ARF (Animal Research Facility), Lincoln, Nebraska

- Fear, C. Marty ..... Agricultural Research Technician I
- Lytle, Kandy ** ..... Research Technician II
- Soester, Jody ..... Agricultural Research Technician I
- Tucker, Steve[2] ..... Research Technician II

VBMS-ARDC - (Agriculture Research and Development Center) Ithaca/Mead, Nebraska

- Bergman, Benjamin ..... Agricultural Research Technician I
- Heldt, Justin ..... Animal Care Taker, On Call

Pre-Veterinary Advising Center

- ■**Steffen, David J.**[1], BS, DVM, PhD, ABVP ..... Advisor
- Fry, Pamela ..... Peer Advisor
- Kilzer, Beth ..... Senior Peer Advisor
- Korus, Jeffrey ..... Peer Advisor
- Kroeker, Meggan ..... Peer Advisor
- Obermiller, Abby ..... Senior Peer Advisor

Cataract Research – Veterinary Basic Sciences (VBS) Building

- ■Lou, Marjorie, PhD ..... Biomedical Biochemist, Professor
- Chen, Chao-Wei (Kate), BA, MS ..... PhD Student
- Fernando, M. Rohan,[2] BS, MSc, PhD, M.Phil. ..... Postdoctoral Research Associate
- Moon, Sung-chur[2], MD, PhD ..... Postdoctoral Research Associate
- Persa, Cristina[2], MD ..... PhD Student
- Xing, Kuiyi, BS, PhD ..... Postdoctoral Research Associate
- Yegorova, Svetlana P.[2], BS, MS, PhD ..... Postdoctoral Research Associate
- Zhang, Wei (Julie)[2] ..... Postdoctoral Research Associate

Immunology Research - VBS

- ■Srikumaran, Subramaniam, BVSc, PhD ..... Immunologist, Professor
- Ambagala, Aruna, BVSc., MS ..... PhD Student
- Ambagala, Thanuja[2], BVSc, MS ..... Research Technologist
- Gopinath, Seetharaman ..... Research Scholar
- Nanjappa, Som, BVSc ..... PhD Student

*Absent on Military Leave
**Acting Manager for ARF

Bacteriology Research - VBS

■Barletta, Raúl, PhD ..... Bacteriologist, Associate Professor
Liu, Xiaofei, BS ..... PhD Student
Zinniel, Denise, BS, MS ..... Research Technologist III

■Cirillo, Jeffrey D., BA, PhD, MS ..... Bacteriologist, Associate Professor
Cirillo, Suat, BS, MS ..... Researcher
Pandey, Amit Kumar[1], BVSc, MSc, PhD ..... Postdoctoral Research Associate
Subbian, Selvakumar[1], BS, MS, PhD ..... Postdoctoral Research Associate
Yan, Ling, BS, MS ..... PhD Student

■Duhamel, Gerald, DVM, PhD ..... Pathologist & Microbiologist, Professor
Cheng, Xiaoxing ..... Research Associate
Dassanayake, Rohanna, BVSc ..... MS Student
Kolappaswamy, Krishnan[2], BVSc ..... MS Student
Rice, Melissa, BS ..... MS Student
Stryker, Cynthia ..... Research Technician III
Zhang, Ruilin, MS ..... MS Student

■Moxley, Rodney, DVM, PhD ..... Pathologist & Bacteriologist, Professor
Baehler, Angela, BS ..... MS Student
Bailey, Doreen, Asst BioSci ..... Research Technician II
Berberov, Emil, PhD ..... Research Associate
Chacón, Ofelia[2] ..... Researcher
Clark, Nicole[2], BS ..... MS Student
Hansen, Karen (*E. coli* Project/AnSci) ..... Research Technician III

Virology Research - VBS

■Donis, Ruben[2], MV, PhD ..... Virologist, Professor
Chen, Li-Mei[2] ..... Visiting Scholar
Chon, Seung Ki,[2] DVM, PhD ..... Visiting Research Scholar
Maman, Ahmed[2], BSc, MSc, PhD ..... Research Associate
Maroni Veiga, Dulce[2], BS ..... MS Student
Rangel, Aymara[2] ..... Visiting Scholar
Gil, Laura[2] ..... PhD Student

■Jones, Clinton, PhD ..... Virologist, Professor
Geiser, Vicki, BS, MS ..... PhD Student
Henderson, Gail, BS, MS ..... Research Technologist II
Inman, Melissa[1], BS, MS, PhD ..... Research Assistant Professor
Jiang, Yunquan, BS, PhD ..... Research Associate
Lavata, Luciane, DVM, MS ..... PhD Student
Peng, Weiping, BS, MS, PhD ..... Postdoctoral Research Associates
Perez, Sandra, DVM, MS ..... PhD Student
Zhang, Yange, PhD ..... Research Assistant Professor

■Kelling, Clayton, DVM, PhD ..... Virologist, Professor
Daniels, Holly ..... MS Student
Topliff, Christina, BS, DVM ..... PhD Student

■Osorio, Fernando MV, PhD ..... Virologist, Professor
Bastos, Reginaldo ..... Visiting Scholar
Brito, Monica, BS ..... MS Student

Delhon, Gustavo A., PhD, MSc, DVM ..... Research Assistant Professor
Jar, Ana ..... Research Associate
Kim, In-kyung, DVM ..... MS Student
Kwon, Byung, BS ..... PhD Student
Ostrowski, Matias ..... Visiting Scholar

VBS Research Support Glassware Preparation Laboratory
▪Duhamel, Gerald E., DVM, PhD ..... Faculty Supervisor
Nilson, David ..... Lab Assistant II
Rajagopol, Janaki ..... Lab Assistant II

UNL Core Microscopy Facility – Beadle Center
Zhou, You (Joe), BSc, PhD ..... Director, UNL Core Microscopy Laboratory

Veterinary Epidemiology Research - VDC
▪Smith, David, DVM, PhD, ACVPM, ABVP ..... Veterinary Epidemiology, Faculty Supervisor
Clowser, Sharon, BS ..... Extension Assistant

VBMS Extension
Clowser, Sharon, BS ..... Extension Assistant, Lincoln
Griffin, D. Dee, DVM, MS ..... Extension Veterinarian, Feedlot Cattle, GPVEC
Smith, David, DVM, PhD .... Extension Veterinarian, Dairy and Beef Cattle Veterinarian, Lincoln

Nebraska Veterinary Diagnostic Laboratory Program
▪John A. Schmitz, DVM, PhD ..... Executive Director
Steffen, David DVM, PhD ..... Director, VDC Lincoln

Veterinary Diagnostic Center (VDC) Office
▪Steffen, David, DVM, PhD ..... Director
Ellis, Roxane, BS ..... Information Systems Analyst
Henning, Donna ..... Clerical Assistant II
Haney, Jennifer ..... Staff Secretary II
Seelmeyer, Mavis ..... Staff Secretary III

VDC Bacteriology Section
▪Hinkley, Susanne[1], DVM, MS, PhD ..... Faculty Supervisor
Cerny, Hank, DVM ..... Diagnostic Microbiology Manager
Ele, Shirley, BS ..... Research Technologist
Mercado, Maria ..... Research Technician III
Nabity, Paul ..... Molecular Diagnostics, Research Technician III
Paucar, Aura ..... Research Technician III
Perez, Margarita, BS ..... Research Technician III
Srikumaran, Pushpa[2], BVSc ..... Research Technician III

VDC Glassware Preparation Service
Heyer, Mary ..... Lab Assistant II

VDC Histology Laboratory
▪Doster, Alan, DVM, PhD ..... Faculty Supervisor
Buhrman, Jonathan ..... Histology Technician III
Claussen, Pat[1] ..... Research Technician II
Johns, LaVonne ..... Histotechnician III
Olmscheid, Robin ..... Laboratory Supervisor

VDC Necropsy Service

- ▪Doster, Alan, DVM, PhD ..... Pathologist, Faculty Supervisor
- Riggert, Christen ..... Research Technician III

VDC Pathology Service

- ▪Doster, Alan, DVM, PhD, DACVP ..... Pathologist
- Brodersen, Bruce, DVM, MS, PhD ..... Pathologist
- Rogers, Douglas, DVM, PhD ..... Pathologist
- Steffen, David, DVM, PhD, DACVP ..... Pathologist

VDC Poultry and Avian Service

- ▪Ebako, Grasso M.[2], DVM, MVPM ..... Poultry Veterinarian

VDC Toxicology Section

- ▪Carlson, Mike[1], PhD ..... Diagnostic Toxicologist/Analytical Chemist
- Rajurkar, Sanju, MS ..... Research Technician II

VDC Virology Section

- ▪Osorio, Fernando, MV, MS, PhD ..... Virologist, Faculty Supervisor
- Dabydeen, Fredrick ..... Lab Assistant II
- Galeota, Judi, BS ..... Lab Manager
- Quinlan, Sarah, BS ..... Research Technician III
- Stamenova-Berberova, Hristina, MS ..... Research Technician III
- Waechter-Mead, Lindsay, BS ..... Research Technician III
- Widner, Kay ..... Research Technician II
- Xie, Liping ..... Research Technologist

Great Plains Veterinary Educational Center (GPVEC) Clay Center, Nebraska

- ▪Rupp, Gary, DVM, MS ..... GPVEC, Director & Professor
- Dana, Ramona ..... Custodian II
- Fox, Christiane ..... Research Technician III
- George, Debbie ..... Staff Assistant
- Griffin, D. Dee, DVM, MS ..... Professor – Beef Cattle Extension Feedlot Veterinarian
- Johnson, Steve, BA ..... Computer Systems Manager/Analyst
- Shuck, Karen ..... Veterinary Technician, Agricultural Research Technician II
- Sonderup, Kelly[2] ..... Student Worker (Computer)

● VBMS HONORS, AWARDS AND RECOGNITIONS, 2003 ●

National and Regional

Academy of Veterinary Consultants Outstanding Service Award

Dr. Dee Griffin - for outstanding contributions to the Academy of Veterinary Consultants

American Association of Laboratory Diagnosticians Award

Dr. Luis Corbellini - visiting scientist-PhD student from Brazil, received the graduate student poster award at the annual AAVLD meeting in San Diego California

Conference of Research Workers in Animal Diseases

Rohana Dassanayake - for best poster presentation in the Gastroenteric Section

Midwest Student Biomedical Research Forum Award

Jenna Achenbach - presentation - MVP Laboratories
Aruna Ambagala - poster presentation

NC-1007 Student Award for Eneteric Disease Research

Rohana P. Dassanayake - for best graduate student poster presentation

University of Nebraska

Agricultural Research Division Honors Student Undergraduate Research Project Award

Karen Lee
Michelle Pavelka
Adam Rogers

Burkey Memorial Fellowship

Aruna Ambagala - scholastic performance and accomplishments as a graduate student

Capital City Kiwanis Teaching Assistant Scholarship

Beth Kilzer - preveterinary student and peer advisor, undergraduate teaching assistant scholarship

CASNR Week Awards

UNL Pre-Vet Club, Student Organization Philanthropy/Service Award
Dr. Jack Schmitz, Finalist, Outstanding Teaching Award

Center for Biotechnology Milton E. Mohr Fellowship

Aruna Ambagala
Christina Topliff

Center for Biotechnology Milton E. Mohr Scholarship

Kristina Holt

Graduate Student Recruiting Grant

Awarded to the Department of Veterinary and Biomedical Sciences from the Office of the Dean of Graduate Studies

Hazel V. Emley Fellowship

Christina Topliff - scholastic performance and accomplishments as a graduate student

John McDonald Fellowship

Sandra Perez - scholastic performance and accomplishments as a graduate student

Scholastic Graduate Research Assistantship - Office of the Dean of Graduate Studies

Debasis Nayak - advisor Dr. A. Pattnaik
Namal Malimbada Liyanage - advisor Dr. M. Lou

Widaman Trust Fellowship

Rohana Dassanayake

VBMS Department

Best Graduate Student Seminar Presentation Award

MS Candidate: Jenna Achenbach
PhD Candidate: Laura Gil and Sandra Perez

Charles Yount Scholarship

Caleb Harms

Susan Ann Smith Mills Award

Marilyn (Buhman) Corbin

Undergraduate Students Dean's List

Spring 2003

Veterinary Sciences Major

Michelle Backlund
Jordan Bader
Rachel Battiato
Megan Becher
Benjamin Britten
Caressa Cantrell
Allison Eitzmann
Pamela Fry
Yoshiaki Hasegawa
David Heftie
Kristina Holt
Joshua Howard
Emily Humphrey
Pamela Karakusis
Sarah LaPatka
Yuko Mori
Laura Pike
Holly Samson
Lindsey Stevens
Justin Villafane

Fall 2003

Veterinary Sciences Major

Donna Bader
Benjamin Britten
Caressa Cantrell
Jeffery Eihusen
Elizabeth Farrow
Pamela Fry
Jennafer Glaesemann
Nicole Hanson
Kristina Holt
Meggan Kroeker
Abby Obermiller
Laura Painter
Michelle Pavelka
Jason Pieper
Trisha Rucker
Sara Schuessler
Angela Shemek
Maria Sonderegger
Carol Sutton
Abby Van Hoef
Rebecca Woolard
Leann Wright

2003 Service Awards

5 years:

Ofelia Chacon-Barletta
Jeffrey Cirillo
Suat Cirillo
Janaki Rajagopal
Joe Zhou

10 years:

Marjorie Lou

15 years:

Roxane Ellis
Deborah George
Douglas Rogers
Gary Rupp
Mavis Seelmeyer
Karen Shuck

20 years:

Rodney Moxley
John Schmitz

●VBMS Committee Assignments, 2003●
Department of Veterinary Biomedical Science

Name	Term	
	Begin	End
Peer Review Committee (3-Yr Appt)		
R. Moxley (Chair/Oct 03 - Sept 04)	October 2003	September, 2006
Gerald Duhamel	October, 2002	September, 2005
D. Dee Griffin	October, 2002	September, 2005
David Steffen	October, 2000	September, 2006
Clayton Kelling	October, 2003	September, 2006
Graduate Committee		
Fernando Osorio, Chair	September, 2000	August, 2004
Gerald Duhamel	October, 2002	July, 2005
Marjorie Lou	November, 2001	October 2004
S. Srikumaran	October, 2002	July, 2005
David Smith	January, 2002	December, 2005
Lee Johnson (Secretarial Support)	--	Indefinite
IBMS Executive Committee		
Fernando Osorio, Chair	March, 2003	July 1, 2004
Gerald Duhamel	March, 2003	July 1, 2004
Marjorie Lou	March, 2003	July 1, 2004
S. Srikumaran	March, 2003	July 1, 2004
Marty Dickman	March, 2003	July 1, 2004
Lee Johnson (Secretarial Support)	March, 2003	Indefinite
Safety Committee		
Raúl Barletta (Chair, VBS)	September, 1999	August, 2002
Robin Olmsheid (VDC)	September, 1998	August, 2004
Kandy Lytle (ARF)	February, 2003	August, 2006
Doreen Bailey (VBS/Technician)	September, 2000	August, 2003
Douglas Rogers (VDC)	September, 1999	August, 2002
(Donna Henning, Secretarial Support/VDC)	July, 1996	Indefinite
Veterinary and Biomedical Science Undergraduate Student Research Coordinator		
Gerald Duhamel	November, 2002	Indefinite
Seminar, Chairman		
John Schmitz	July, 1989	Indefinite
George A. Young Swine Conference Planning Committee		

Name	Term	
	Begin	End
Bruce Brodersen (Chair)	January, 2002	December, 2003
Tom Buelt	January, 2002	December, 2003
Dave Ellis	January, 2002	December, 2003
Larry Germer	January, 2002	December, 2003
Phil Hardenburger	January, 2002	December, 2003
Mike Brumm	January, 2002	December, 2003
Alden Zuhlke	January, 2002	December, 2003
Jim Unwin	January, 2002	December, 2003
Jeff Husa	January, 2002	December, 2003
(Sharon Clowser, Conference Coordinator)	January, 2002	December, 2003
Department Curriculum Committee		
Rodney Moxley (Chair, April 2003)	September, 2000	Indefinite
David Steffen	August, 2003	Indefinite
Clayton Kelling	September, 2000	Indefinite
S. Srikumaran	September, 2000	Indefinite
Nebraska Veterinary Student Admission Committee		
Bruce Brodersen (Chair, 2003/2004 - UNL/VDC)	August, 2001	August, 2004
Gary Rupp (NU/GPVEC)	August, 2002	August, 2005
Rosemarie Nold (UNL/AnSci)	February, 2003	February, 2005
Ronnie Elmore (KSU/Administrative Oversight)	–	Indefinite
Bonnie Rush (KSU)	August, 2002	August, 2005
Lynn Locatelli (NVMA)	August, 2001	August, 2003
Elizabeth Nelson (NVMA)	August, 2002	August, 2004
Mavis Seelmeyer (UNL Secretarial Coordinator)	–	Indefinite
Barb Perry (KSU Secretarial Coordinator)	–	Indefinite
Departmental Computer Support Designee and Liaison to IANR Computing		
Roxane Ellis	1990	Indefinite
CASNR Curriculum Committee (Veterinary and Biomedical Sciences; Biochemistry; and Food Science and Technology Departments)		
Clayton Kelling	July, 2003	June, 2005
CASNR Faculty Advisory Council		
Rodney Moxley	2003	2005
Pre-Veterinary Club Advisor		
Hank Cerny	February, 2003	August, 2006
ARD Advisory Council (District 6 -- Biometry; Entomology and Veterinary and Biomedical Sciences Departments)		
Gerald Duhamel (Vet Biomedical Sci)	July, 2002	June, 2005
UNL Academic Senate		
Douglas Rogers	April, 2001	March, 2004
Institutional Animal Care and Use Committee		

Name	Term	
	Begin	End
Gerald Duhamel	January, 2000	December, 2005
ARDC Oversight Committee		
John Schmitz	1998	Indefinite
VBMS Husker Harvest Days Committee		
Clayton Kelling	June 2002	Indefinite
Mike Carlson	June 2002	Indefinite
Dee Griffin	June 2002	Indefinite
David Steffen	June 2002	Indefinite
UNL Radiation Safety Committee		
Raúl Barletta	February, 2000	Indefinite
VBMS Representative to UNL Library		
Raúl Barletta	2000	Indefinite
VBMS Website Oversight Committee		
Fernando Osorio	February, 2003	Indefinite
Raúl Barletta	February, 2003	Indefinite
Bruce Brodersen	February, 2003	Indefinite
David Smith	February, 2003	Indefinite
Rodney Moxley	February, 2003	Indefinite
Roxane Ellis, Technical Support	February, 2003	Indefinite

● VBMS FACULTY PROFILES ●

Raúl G. Barletta
Associate Professor, BS, MS, PhD
Microbiology/Bacterial Genetics
Appointment: 0.80 FTE Rsch; 0.1 FTE Tchg

The main focus of my laboratory is the study of mycobacterial pathogens including *Mycobacterium paratuberculosis* and *M. avium*. *M. paratuberculosis* is the causative agent of Johne's disease, a wasting chronic enteritis affecting all ruminants. *M. avium* is the agent of tuberculosis in birds and a major opportunistic pathogen in immunocompromised individuals. Since *M. paratuberculosis* and *M. avium* are slow growing and highly homologous, studies on one organism are readily applicable to the other. Furthermore, this research may be also relevant to the understanding of the diseases caused by other mycobacterial pathogens (*M. bovis*, *M. tuberculosis*). The major long-term goals in my laboratory are: 1) to understand virulence and drug-resistance mechanisms in pathogenic mycobacteria, and 2) to develop molecular tools to diagnose and control mycobacterioses. Additional interests include research projects on *Escherichia coli* pathogenesis and plant endophytic colonizing bacteria pursued in collaboration with other laboratories at UNL.

We have developed a genetic system for *M. avium* and *M. paratuberculosis* that includes phage infection, plasmid transformation, and transposon mutagenesis. Future plans will focus on the identification, isolation, and characterization of attenuated mutants. These mutants will be tested in a recently developed mouse model of paratuberculosis. We have also made progress in the analysis of *M. paratuberculosis* secreted and cellular immunogenic proteins. We have cloned and sequenced the genes for the superoxide dismutase and alkyl hydroperoxidase. Gene inactivation and functional studies are in progress. From these molecular studies, a practical application test to measure the susceptibility of *M. paratuberculosis* to antimicrobial agents was developed. These steps are essential prerequisites for the understanding of pathogenesis, and the development of anti microbial therapies and new and more effective vaccines compatible with diagnostics.

Drug resistance studies in mycobacteria have focused on the molecular targets of peptidoglycan synthesis inhibitors. We have identified the molecular targets for D-cycloserine. One of these targets is the enzyme D-alanine racemase, involved in the initial steps of peptidoglycan biosynthesis. Furthermore, we have shown that overproduction of D-alanine racemase in mycobacteria underlies the D-cycloserine resistance phenotype of resistant mutant strains. The specific molecular mechanism responsible for the overproduction of this enzyme was shown to be a promoter-up mutation in the control region of the D-alanine racemase gene. Future studies will focus on the biochemical and genetic characterization of the D-alanine racemase enzyme and its gene from *M. avium* and *M. tuberculosis*.

My teaching responsibilities include serving as co-instructor for the courses VBMS 951 Advanced Molecular Infectious Diseases and VBMS 424/824 Basic Molecular Infectious Diseases. I developed the syllabus for VBMS 951 which was recently modified for team-teaching with newly hired faculty with expertise in the area (Dr. J.D. Cirillo). In addition, the syllabus for the new introductory course VBMS 424/824 was developed with Dr. Cirillo. I have also supported the teaching of VBMS 441/841 Pathogenic Microbiology from 1992 to 1998. I advised six MS and three PhD graduate students who have completed their degrees. I served as co-advisor for 2 MS graduate students who completed their degrees.

Bruce W. Brodersen
Research Assistant Professor, DVM, MS, PhD
Pathologist
Veterinary Diagnostic Center
Appointment: 1.00 Service

My position was created out of a need for more pathologists at the Veterinary Diagnostic Center. The increased need was a result of continual increase in the numbers of case submission. Existing faculty at the Diagnostic Center were not able to meet other commitments as a result of the elevated case load. Funding for my position comes entirely from revenues generated by submission fees received at the Diagnostic Center.

My efforts are directed at coordination of appropriate testing of samples submitted to the Diagnostic Center, assimilating test results for determining a diagnosis, and generating a suitable report to the submitting veterinarian or owner. The range of species that samples originate from is wide and consists mainly of food animals and companion animals with avian species as well as wild and or exotic and aquatic species. I also supervise the contract with the USDA for testing of samples for scrapie in sheep and chronic wasting disease in deer.

I have no formal research FTE, but I am conducting projects which are directed at investigating diseases of cattle. Currently my projects concentrate mainly on bovine viral diarrhea virus (BVDV). One of these studies includes detection of cattle persistently infected with BVDV. I am collaborating with researchers at Auburn University, investigating the role of BVDV as a reproductive disease in cattle.

Michael P. Carlson, MS, PhD
Diagnostic Toxicologist/Analytical Chemist
Veterinary Diagnostic Center (VDC)
Appointment: 85% Diagnostic, 15% Teaching

I serve as a diagnostic toxicologist for the VDC. I review cases submitted for toxicology services, obtain case histories as needed, interpret diagnostic toxicology results, write final toxicology reports for diagnostic cases and report results to case submittors or VDC diagnosticians. I also consult with veterinarians, clients and university faculty and staff about toxicology and analytical services.

I also serve as an analytical chemist for the VDC Toxicology Laboratory. I manage the operation of that laboratory; select and validate methods for analytical services; supervise, train and manage the staff of that laboratory; and assist with performance of analytical services as required.

I teach VBMS 410 – Introduction to Pharmacology and Toxicology, a 4-credit hour, integrated studies course required for Veterinary Science undergraduate majors. The course is intended to introduce students to basic principles of drug action and toxic effects of chemical substances. The course also emphasizes written and oral communication skills. Students are required to write a position paper on a controversial pharmacology or toxicology topic and present their position orally to the class. It is offered annually each fall semester.

My research interest is nitrate toxicosis in cattle, especially chronic nitrate exposure related to abortions.

I also am interested in the application and implementation of international standards for laboratory certification to veterinary diagnostic laboratories.

Jeffrey D. Cirillo, BA, PhD, MS
Associate Professor
Infectious Diseases
Appointment: 0.85 FTE Rsch; 0.15 FTE Tchg

Our laboratory is interested in the pathogenesis of bacterial lung infections, which currently cause disease in more than one-third of the world's population; such as, tuberculosis and Legionnaires' disease. We are examining the virulence mechanisms of bacteria using cellular, molecular and genetic techniques. Our primary research goal is to obtain a better understanding of the roles of the pathogen and host in disease so that we may develop novel methods for prevention and treatment. These studies should contribute to our understanding of host-pathogen interactions at the molecular and cellular level. In our current studies we have identified several bacterial genes that are required by these organisms to cause disease in animals and humans. Through the use of genomics, proteomics and functional analysis of these genes and mutant bacterial strains, we have better defined how these organisms invade eukaryotic cells and replicate within them. These mechanisms of invasion are critical to the ability of these organisms to survive both during infections and in environmental reservoirs. Infectious diseases involve both the host and pathogen during interactions that result in pathogenesis. For this reason, we also examine mechanisms of host defense, immune evasion, signal transduction, phagocytosis and intracellular trafficking. The primary cell types involved in virulence of respiratory pathogens are human and murine macrophages, but environmental protozoa also play a role and have many similarities to mammalian phagocytic cells. Through examination of interactions by bacterial pathogens with both mammalian and environmental phagocytic cells we have identified potential receptors, signal transduction pathways, cytoskeletal components and intracellular compartments that are involved in the ability of these organisms to cause disease. This two-pronged approach to understanding infectious disease has allowed us to develop relatively comprehensive models for the mechanisms of invasion and pathogenesis during infections in humans and animals. We expect that the continued application of this approach should yield great insight into infectious diseases in general, in addition to that of respiratory pathogens, some of the most important infections in both animals and humans. My main teaching responsibilities include the continuous updating and improvement of two advanced courses in microbial pathogenesis to support the current Departmental curriculum and Ph.D. program. It is expected that these courses will attract a wide audience of graduate and undergraduate students from both UNL and UNMC.

Ruben O. Donis
Professor, MV, PhD
Virologist
Appointment: Rsch 80%; Tchng 15%; Scholarly Srv 25%

Area of Expertise - Virology - Animal RNA virus molecular biology, infectious diseases

Research in our laboratory is aimed at advancing knowledge on the virulence and host range of animal viruses with RNA genomes. To this end, we study the molecular mechanisms by which viral translation, genome replication and virion assembly are coupled. We have taken advantage of the small RNA genome size of influenza and the bovine pestivirus BVDV to develop unique reverse genetic manipulation tools. Our laboratory is now utilizing infectious clones of these viruses to re-design viral genomes to probe molecular mechanisms of coupling between translation, RNA synthesis and virion assembly, all of which require interaction with host cell components. This knowledge is essential to understand pathogenesis and host range in RNA viruses of medical and veterinary importance. This information may also provide clues to understand the closely related Human Hepatitis C virus.

The significance of the molecular virology findings for pathogenesis and host responses to viral infection is exploited by establishing collaborations to develop antiviral strategies. We are are involved in efforts to investigate influenza and BVDV virus antigen presentation to develop new strategies for immunization against viral diseases. In collaboration with Dr. J. E. Galán's lab at Yale University, we are manipulating the type III secretion system of avirulent Salmonella spp. to elicit protective cellular immunity against viral infections.

This work could not be done without the assistance of one Research Assistant Professor, one laboratory Supervisor, two postdoctoral fellows and three graduate students. Funds to support research are provided by the NIAID, National Institutes of Health, the USDA NRI CRGO, the Institute of Agriculture and Natural Resources and the Center for Biotechnology at UNL.

Alan R. Doster
Pathologist, DVM, MS, PhD, ACVP
Veterinary Diagnostic Center
Appointment: 100% Diagnostic Service

I serve as a diagnostic pathologist in the VDC and rotate necropsy duty on a regular basis with the other pathologists. We are responsible for the gross examination of various species, histological examination of tissues from necropsies and surgical biopsies; requesting and interpretating results from the bacteriological, serological, virological, toxicological tests which are part of the laboratory work-up; and establishing a diagnosis or rendering an opinion regarding each case. I spend a considerable amount of time on the telephone consulting with veterinarians and livestock owners regarding clinical histories, case submissions, and results of diagnostic testing. I have served as an expert witness many times for legal proceedings or insurance inquiries, the largest being in excess of $20 million. I have acted as a consultant for United States Department of Agriculture regarding foreign veterinary diagnostic laboratory capabilities.

I have no formal teaching FTE, but have served as the faculty coordinator for VBMS 901 (Diagnostic Techniques) and have taught several advanced pathology courses for pathology residents and graduate students. In addition, I have served as major advisor for master's and doctoral students and am a member of several graduate supervisory committees in the Department.

My research interests consist of infectious diseases of cattle and swine. I have been active in pursuing emerging disease syndromes initially seen in the VDC such as porcine reproductive and respiratory syndrome virus (PRRSV) and porcine circovirus infection. The PRRSV project led to the development of a commercially available PRRSV vaccine. I and the other pathologists serve primarily as consultants in a team-oriented approach to research problems where each member of the team contributes his area of expertise to the project. Other faculty in the Department who have major research appointments act as project leaders and request our assistance as necessary.

Gerald E. Duhamel, BS, DMV, PhD, ACVP
Professor
Pathologist/Microbiologist
Appointments: 0.80m FTE Rsch., 0.10 Tchg., 0.10 Serv.

My long-range goal is to define basic mechanisms of host-parasite interactions, and their relationship to susceptibility or resistance against disease, particularly within the framework of enteric diseases caused by bacteria and viruses. Presently, I am engaged in basic and applied biomedical research aimed at characterizing molecular mechanisms of microbial pathogenesis and host defense with practical applications to diagnosis and control of enteric diseases of animals and human beings. Specifically I am investigating the biology of intestinal infection by the spirochete bacteria *Brachyspira pilosicoli*, *Brachyspira hyodysenteriae*, and other pathogenic intestinal spirochetes, enterohepatic *Helicobacter* species of human and animals, *Lawsonia intracellularis* an obligate intracellular bacterium that causes proliferative enteropathy in non-human primates and animals, and group A rotaviruses, a major cause of diarrheal disease in human infants and animals. Current research addresses bacterial virulence factors and model development of intestinal injury and repair, phenotypic and genotypic bases of microbial pathogenesis, development of molecular methods for diagnosis of enteric diseases and control using subunit and recombinant vaccines.

Dicky Dee Griffin
Professor, BS, DVM, MS
Pathologist and Nutrition
Clay Center, NE
Appointment: 0.50 Teaching, 0.30 Extension, and 0.20 Service

I am responsible for creating and coordinating veterinary medical education opportunities in feedyards. Through my extension appointment, I am responsible for conducting applied field research that relates to feedlot production management and beef safety. I am also responsible for disseminating production management information to the beef feedlot industry. Through my service commitment I provide a substantial portion of the veterinary medical service to the MARC feedlot. I also act as a consulting veterinarian to Nebraska feedlot veterinarians and other feedlot specialists. Through these contacts, I am able to provide unique educational opportunities to fourth-year veterinary students, veterinary technician students and animal science students.

The crux of my research involves management and production with an emphasis on creating or perfecting techniques that can be of direct benefit to the feedlot industry. I have a passionate interest in beef quality assurance (BQA) and a portion of my research focuses on developing and evaluating pre-harvest techniques that will help guarantee the wholesomeness of the beef supply in the United States. Developing and disseminating pre-harvest HACCP techniques for use in beef feedlots has become a major effort. I recognize the economic need for the beef cattle industry to present consumers with a consistently high quality product. I communicate this information to feedlot veterinarians, feedlot producers and potential consumers through my extension. This involves poster displays at trade shows, invited presentations and through GPVEC's Internet BQA home page. I always include BQA as a part of the focus of my consulting work. Food safety, including pre-harvest HACCP, residue avoidance and minimizing injection site blemishes is always a part of the feedlot teaching curricula at GPVEC.

Inter-departmental or Inter-institutional Cooperative Activities

Cooperator	Cooperative Activity
KSU, Other Colleges of Veterinary Medicine	Electives
Industry representatives and Academicians	Continuing Education Seminars
KSU	Fundamentals of Food Animal Practice (1st yr Students)
T.J. Klopfenstein, E. Erickson (UNL AnSci Dept)	Advanced Undergraduate Feedlot Health Management
T.J. Klopfenstein, E. Erickson (UNL AnSci Dept)	Undergraduate Feedlot Health
T.J. DeGroff (Practitioner, Burwell, NE)	Training Students
MARC Scientists	Research Projects
Assigned UNL Faculty	ExpoVision and High School Careers Workshop

Susanne Hinkley
Assistant Professor, DVM, MS, PhD
Diagnostic Microbiologist
Veterinary Diagnostic Center
Appointment: .50 FTE Diag Srv; 50% Rsch

Diagnostic Service

Our AAVLD-accredited diagnostic bacteriology laboratory offers full service bacterial, mycological, and parasitological diagnostics. In addition, we have expanded our molecular diagnostic capabilities such that we now offer PCR and RFLP assays for detection, speciation and virulence typing of several bacterial pathogens. As a certified laboratory, we conduct the culture and serology testing for the state's Johne's program. Our in-house developed mycoplasma culture test has been implemented and is widely used by clientele. While offering these services, we are constantly striving to implement new tests both in diagnostic bacteriology and molecular diagnostics.

The laboratory is currently involved in collaborative research with industry, and also has research projects planned to optimize the methodology in DNA extraction for PCR, and to utilize our mycoplasma culture and PCR assay in a field study. Another area of interest is 'infectious bovine keratokonjunctivitis', a disease of cattle caused by *Moraxella* species. The work of a Master's project is focusing on the characterization of virulence factors (in particular a putative RTX exotoxin) of *Moraxella* (subgenus *Moraxella*) *bovis* and *Moraxella* (subgenus *Branhamella*) *ovis*.

Research

We are involved in a large collaborative project with the goal of developing, validating and implementing methods for detection and control of *E. coli* and *Salmonella* in feedlots. The data obtained so far indicate that the novel methodology of testing on the pen level may provide a sensitive, reliable and practical means of identifying pens of cattle shedding *E. coli* and/or *Salmonella*. In addition, the developed methodology may aid in identifying potential points of intervention within a pen of cattle. Currently, we are in the process of validating these pen testing strategies in commercial feedlots. In our research feedlot, we have conducted a study to test the usefulness of an anti-E. coli O157:H7 vaccine and a direct fed microbial, both individually and together, in the reduction of the fecal shedding of O157:H7. The preliminary results are very encouraging.

We are also involved in the development and preliminary validation of a field test to test live animals for the presence of antimicrobial residues before they go to slaughter.

Clinton J. Jones
Professor, BA, PhD
Molecular Virologist
Appointment: 0.90 Rsch, Tchg. 0.10

Statement of Current Research Activities

Latency of α-herpesviruses is the focus of research in my laboratory. My laboratory is using Bovine Herpes Virus 1 (BHV-1) and Herpes Simplex Virus 1 (HSV-1) to study virus host interactions. HSV-1 is the leading cause of corneal blindness and may be a cofactor in Alzheimer's disease. Approximately 90% of all human beings are infected with HSV-1. BHV-1 is a significant viral pathogen of cattle that can induce respiratory disease, abortion, or occasionally encephalitis. BHV-1 is also a causative agent of "Shipping Fever" or Bovine Respiratory Complex. As a consequence of BHV-1 infections, the cattle industry suffers more than $500,000,000/year in losses.

1. BHV-1 Latency Projects

We have previously determined that the LR gene encodes a protein that is expressed in sensory neurons and during productive infection. LR protein expression (ORF-2) is required for the latency-reactivation cycle of BHV-1 in cattle, and inhibiting apoptosis. Our recent studies have also demonstrated that the LR gene can replace HSV-1 LAT and stimulate spontaneous reactivation from latency using a rabbit ocular model of infection. Interfering with ORF-2 expression inhibited the ability of HSV-1 to reactivate from latency indicating that ORF-2 encodes a function(s) that promotes the latency-reactivation cycle of BHV-1 and HSV-1. We recently discovered a novel BHV-1 gene that is expressed in trigeminal ganglia of latently infected calves (ORF-E). Neuronal cells that over-express ORF-E appear to differentiate and sprout neurites.

Future studies related to the BHV-1 latency projects

- Identification of cellular proteins that interact with ORF-2 and ORF-E by two-hybrid assays.
- Identification of protein coding domains in ORF-2 that inhibit apoptosis and reactivation from latency.
- Site-directed mutagenesis of ORF-E will be employed to construct a recombinant virus that does not express the ORF-E protein.

2. HSV-1 LATENCY PROJECT

We are using site-specific mutagenesis to identify LAT sequences that interfere with caspase 8 and caspase 9 induced apoptosis. We are also using mouse and rabbit models we will utilize gene array techniques to compare the levels of pro-apoptotic and anti-apoptotic genes that are expressed in trigeminal ganglia following infection. In human neuronal cells, LAT inhibits expression of interferon (IFN)-α and IFN-β during productive infection. Consequently, we suggest that LAT plays a role in inhibiting the interferon response. This is a potentially important observation because it suggests that LAT protects neurons from the toxic effect of interferon.

Future studies related to LAT inhibiting the IFN response

- Does LAT inhibit interferon-induced apoptosis? Interferon is known to induce apoptosis in certain cell-types. There are several cell culture assays that can be applied to test whether LAT interferes with the toxic effects of interferon. We will use these approaches to test whether LAT can inhibit interferon-induced apoptosis.
- Gene arrays will be performed to measure expression of inflammatory cytokines and the interferon pathway in trigeminal ganglia of mice infected with wild-type HSV-1 or a LAT mutant.

Clayton L. Kelling
Professor, BS, MS, PhD, DVM
Microbiologist/Virologist
Appointment: 85% Research and 15% Teaching

Our research is focused on pathogenesis of bovine respiratory syncytial virus (BRSV) and bovine viral diarrhea virus (BVDV) infections in cattle. Immunity to BRSV infection is incomplete and reinfections occur. Protective host immune responses to vaccines or natural infections may be compromised by mutation of the surface glycoproteins. We are examining the roles of the BRSV surface attachment (G) and fusion (F) glycoproteins in pathogenesis and immunity. Genetic and antigenic heterogeneity, and structure of the BRSV G and F glycoprotein are being studied to determine the influence of those variables on survival of the virus in the host and on development of protective immunity in the host. Our studies involve use of recombinant BRSV glycoproteins expressed in insect cells using the baculovirus vector and developing of a cDNA BRSV F protein vaccine.

The overall goal of our BVDV research is to study the mechanisms involved in the pathogenesis of acute genotype 2 BVDV infections by studying virulence. We are examining the 5' untranslated region (5'UTR) of BVDV isolates for conserved nucleotide base substitutions in the internal ribosomal entry site (IRES) which are biologically significant. Translation studies using cDNA plasmid constructs of the 5' UTR of isolates from a panel of genotype 2 BVDV isolates are being used to study relationships between translational efficiency and virulence of individual isolates in experimental calf infection studies.

Since naturally-occurring pneumonia in cattle or neonatal calf diarrhea typically involves infection of the host with more than one infectious agent, we are also studying the interaction of BVDV with BRSV or bovine rotavirus in concurrent *in vivo* and *in vitro* infections.

Teaching responsibilities include serving as major advisor for graduate students, mentoring undergraduate students conducting thesis research projects, and as course instructor. I am the sole instructor for two courses, Principles and Prevention of Livestock Diseases and our departmental undergraduate capstone course: Integrated Principles and Prevention of Livestock Diseases. Each year, I have also contributed guest lectures in immunovirology or vaccinology courses.

Marjorie F. Lou, BS, MS, PhD
Professor
Biochemistry/Biomedical Sciences
Appointment: 0.90 FTE Rsch; 0.10 FTE Tchg

Main Focus: Biochemical Mechanism of Senile Cataract Formation

Our focus on the biochemical mechanism of age-related cataract formation is oxidative stress. We used hydrogen peroxide-induced cataract in organ culture condition as our model to study the progressive changes in morphology and intracellular redox potential in the lens. We demonstrated that lens opacification is associated with the increased protein insolubility and protein aggregation, resulting from lens protein oxidation by oxidative stress. We also showed that the thiol groups in lens proteins are oxidized by forming protein-thiol mixed disulfides first followed by protein protein disulfide formation, a condition that will lead to lens opacification. We studied the site of thiolation on lens proteins by using mass spectrometry and found a direct evidence that protein thiolation caused change in protein conformation, thus supporting our hypothesis that protein-thiol mixed disulfide formation plays an important role in cataractogenesis.

We discovered that the lens has an intrinsic repair enzyme, thioltransferase, which can repair the damaged lens proteins/enzymes and restore their biological functions. We cloned, sequenced and characterized the enzyme and found it to be extremely oxidant-resistant in the lens epithelium cells. Its physiological function is proposed to be an oxidantive stress defense enzyme by preventing the accumulation of oxidant induced protein-protein disulfide in the lens and to regulate the thiol/disulfide homeostasis so that the lens will not be permanently damaged by oxidative stress.

Signal Transduction in the Diabetic Lens

We use the streptozotocin-induced diabetic rat as our model to study the extralenticular stimulus that can effect the modulation of cellular signals in the lens epithelial cells. We have previously found that diabetic condition induces stimulated phosphoinositide cycle, a signal transduction system in the lens. The diabetic condition apparently causes the vitreous to accumulate unusually high level of growth factors, such as bFGF, from the leaky retinal vascular, which in term affect the normal cellular proliferation and differentiation process in the lens and may cause an abrupt lens opacification. We discovered that vitreous from diabetic rat eye can stimulate MAPkinase, but inhibit PI3kinase in the lens epithelial layers. We are using both the in vivo diabetic rat model and porcine lens cultured under hyperglycemic condition as the ex vivo model. Currently, we are studying the effect of aldose reductase inhibitors, which are proven to prevent diabetic complications in the eye, on signal transductions in the lens of diabetic rats.

Cataract Models

Our effort is also to establish a cataract model relevant to humans. Because of the epidemiological finding that cigarette smoking is associated with nuclear cataract in humans. We used nicotine and cigarette smoke condensate to induce cataract in vitro. Both conditions can induce a prominent cataract within a few days in the organ culture. Efforts are now concentrating on the mechanism of such cataract formation.

Rodney A. Moxley
Professor, DVM, PhD
Pathologist
Appointment: 0.90 Rsch; 0.10 Tchg

My research involves two main areas, the pathogenesis of enterotoxigenic *Escherichia coli* (ETEC) in swine and pre-harvest food safety on *E. coli* O157:H7. My research on ETEC in swine is focused on study of the roles of enterotoxins in enhancement of bacterial colonization of the intestine and causation of diarrheal disease. We are also currently studying the role of the immune response to K87 capsular polysaccharide in complement-mediated serum killing of ETEC serotype O8:K87. My research on *E. coli* O157:H7 mainly involves study of the roles of secreted bacterial proteins and immune responses to these proteins in enhancement or reduction of intestinal colonization, respectively. In addition, my research on *E. coli* O157:H7 involves collaborative field studies addressing the epidemiology and testing of pre-harvest intervention strategies for this organism in feedlot cattle.

My teaching responsibilities involve the instruction of BIOS/VBMS 441/841 Pathogenic Microbiology, serving as major advisor for graduate students, and serving as a member of graduate supervisory committees. I have also served several terms as the departmental representative on the College of Agricultural Sciences and Natural Resources (CASNR) Curriculum Committee.

Fernando A. Osorio
Professor, MV, MS, PhD, ACVM
Virologist
Appointment: 0.60 FTE Rsch 0.40 FTE Diag Srv

My research centers on pathogenesis of viral infections. In the last decade we have focused on a major viral agent that affects swine: Porcine Reproductive and Respiratory Syndrome Virus (PRRSV, an arterivirus, ssRNA+ genome).

PRRSV currently causes the most economically significant infectious disease of US swine stock. Our initial interest in this disease centered on the primary characterization of the cell tropism of this virus *in vivo*. We have detected and characterized a novel tropism of PRRSV for male germ cells. Such a specialized tropism of PRRSV results in death of these cells by (*in vivo*) induction of apoptosis. This selectivity for testicular germ cells also explains the transmission of PRRSV via semen. We have also further characterized the immunobiology of persistence of this virus in convalescent animals. Our research seems to indicate that, contrary to other known examples of RNA virus persistence, the persistent infection established by PRRSV is finite and seems to involve a low level of productive infection that progressively declines until complete viral clearance takes place. We found that during the period of viral persistence, extensive modulation of the homologous (PRRSV-specific) cell-mediated and humoral immune response takes place.

We are currently involved in the characterization of the mechanisms responsible for establishment of protective immunity against PRRSV. There is an urgent need for improvement of the vaccines that are currently used against PRRSV. We have discovered that a major role for protection against infection and disease caused by PRRSV resides with a type of PRRSV-specific antibodies that have the ability to render PRRSV uninfectious (i.e. antibodies that neutralize PRRSV). The key to a better protection against PRRSV resides on the development of better and safer vaccines that would prevent infection and possess more genetic stability than the commercial attenuated vaccines currently in use. To that end, we are interested in: 1) characterization of the major immunogenic components of PRRSV and 2) characterization of the genes responsible for the ability to produce disease (virulence) by PRRSV. Knowing the genetic basis of PRRSV virulence and attenuation should permit a more precise design of safer, more efficacious vaccines.

Diagnostic Service: As the director of diagnostic virology at the Veterinary Diagnostic Center, my main goal has been to expedite the diagnostic process through the implementation of rapid tests that are based on the direct detection of viral components or anti-viral antibodies in the clinical sample. I am particularly interested on the evaluation of the fitness and robustness of new commercial diagnostic serologic kits for PRRSV and for Foot-and-Mouth Disease Virus (FMDV). In the latter case, the differential (i.e. capable of distinguishing infected from vaccinated animals) kits for FMDV may be of cardinal importance to US Agriculture, in case any form of vaccination is considered as a viable rapid response against a possible outbreak of this disease in the US.

Regarding teaching, I collaborate with team teaching of virology courses. Together with Dr. Charles Wood, I co-teach a course on Advanced Viral Pathogenesis.

Asit K. Pattnaik
Associate Professor, BS, MS, PhD
Virologist
Appointment: 0.80 FTE Rsch; 0.20 FTE Tchg

My research focuses on various aspects of viral genome transcription, replication, and virus assembly in cells infected with viruses. As model systems for these studies, we use vesicular stomatitis virus (VSV), a non-segmented negative-strand RNA virus, hepatitis C virus (HCV), a positive-strand RNA virus, and porcine reproductive and respiratory syndrome virus (PRRSV), another positive-strand RNA virus. VSV is a cattle pathogen but has been widely used as a paradigm for understanding of biology of this group of RNA viruses that include some of the most serious human pathogens. HCV is a significant human pathogen for which no effective antiviral therapy is currently available. PRRSV causes economically significant diseases in swine population.

In recent past, our research has been centered on the understanding the mechanism of VSV genome transcription and replication. We have generated plasmids encoding subgenomic replicons of VSV that when transfected into mammalian cells, faithfully reproduce the processes of transcription and replication that is normally observed in virus-infected cells. Using the system of reverse genetics that I developed several years ago, we have examined many different aspects of the mechanisms of this virus genome transcription and replication. We have proposed a model suggesting that nucleotide sequences present at the beginning and the end of each gene coding sequences of VSV contain regulatory signals that mediate synthesis of five individual mRNAs from the large viral genome in infected cells. In addition, in a separate model, we have proposed that differential phosphorylation of one of the key viral proteins (the phosphoprotein, P) regulates the transcription and replication functions of the viral RNA polymerase. Logical ongoing studies are directed at generating and characterizing mutant viruses with defects in the P protein so that it may be possible to create viruses with attenuated phenotypes for development of viral vaccines.

In the area of HCV, we are attempting to develop a system for replication of subgenomic replicons in transfected mammalian cells. These are extremely challenging studies but if successful, will advance the field significantly. For these studies, we have generated a variety of HCV subgenomic replicons and are currently examining their ability to replicate in transfected cells. In addition, our studies are directed at generating infectious HCV from mammalian cells. Currently, attempts to develop antiviral therapy against this virus are hampered by the lack of a system to grow and propagate the virus in cultured cells.

With PRRSV, we are attempting to develop an infectious molecular clone of the virus with the ultimate goal of studying the mechanism of virus genome transcription and replication. Using infectious VSV cDNA clone, we are generating recombinant VSVs containing PRRSV genes to examine cell-mediated and humoral immune response to the specific PRRSV proteins.

I have not had the opportunity to be involved in teaching, but do plan to teach graduate and undergraduate courses in the near future.

Douglas G. Rogers
Associate Professor, BS, DVM, MS, PhD
Pathologist
Veterinary Diagnostic Center
Appointment: 1.0 Diagnostic Service

My major responsibility within the Department of Veterinary and Biomedical Sciences and within the Veterinary Diagnostic Center is diagnostic veterinary medicine. As a diagnostic pathologist, the position requires the histopathologic examination of diseased tissues, performing necropsies, assimilation and evaluation of supportive laboratory data, reporting to referring veterinarians or animal owners, preparing the laboratory reports and researching pertinent scientific literature. My special interest is conducting field investigations relative to infectious disease of livestock. This position has afforded me several opportunities to identify "new" infectious diseases of livestock and also to identify "new trends" of "old diseases." The ultimate goal of these investigations has been (and will be) to establish intra- and inter- institutional collaborative studies on the pathogenesis of infectious diseases of livestock. My teaching responsibilities include the training of graduate students/residents interested in diagnostic veterinary medicine, advising graduate students (as major advisor or committee member), conducting research on bacterial diseases of livestock.

Gary P. Rupp
Professor, DVM, MS, ACT Diplomate
Theriogenology
Director, Great Plains Veterinary Educational Center
Clay Center, Nebraska
Appointment: .50 Tchg: .30 Rsch; .20 Srvc

The University of Nebraska Great Plains Veterinary Educational Center provides teaching, clinical training and experience for veterinary students in the professional curriculum in the joint KSU/UNL program in veterinary medicine. This mission is accomplished through another important activity, which is providing health and production management services for the U. S. MARC livestock in cooperation with the Herd Health Veterinarian. The combination of duties provides an excellent opportunity for student experience in clinical veterinary medicine and livestock management.

Another important area of teaching is development of the continuing education program which involves working with graduate veterinarians and other allied speicialists in diverse areas of beef cattle production and management. We are currently providing the seventh series of the Beef Cattle Production Management which increases our total participants to over 120 veterinarians from throughout the U.S. and Canada. During the past 12 months the Series has evolved into an optional graduate program leading to a MS degree through distance education to those interested. The Series is currently being taught by University of Nebraska faculty from Animal Science, Agronomy, Veterinary Science, and other specialists from several universities and beef industry positions.

Research by faculty involves projects with cooperating producer herds and private feed yards in Nebraska that permits tracking calves through retained ownership from birth to processing, development of quality assurance programs for beef producers, and work to control foodborne pathogens. Additional projects are carried out in cooperation with scientists at MARC in areas of neonatal health and production.

In the future the GPVEC program is planning to expand the interaction of other colleges of veterinary medicine and related professionals to broaden the teaching and industry exposure for graduate veterinarians and allied consultants to provide in-depth coverage of production, management, economic, and health related issues essential for providing service to progressive livestock producers. We hope to accomplish this goal by working with students during their entire four year veterinary curriculum.

The faculty wish to continue improving areas of clinically related research, veterinary service to the U.S. MARC, and the overall teaching program both on site and distance with the long term objective of improving service and knowledge for producer performance and sustainability.

David R. Smith
Associate Professor, BS, DVM, PhD, ACVPM, ABVP
Extension Dairy and Beef Veterinarian
Veterinary and Biomedical Sciences
Appointment: .75 FTE Ext; 0.25 Rsch

The goals of my research and extension programing are to contribute new knowledge and apply existing knowledge to solve animal and public health problems associated with dairy and beef production systems. I conduct research on, and communicate applications of, biosecurity and pathogen containment to control pathogens that affect dairy and beef cattle health and pre-harvest food safety.

My current research and extension efforts are directed towards animal production food safety related to *Escherichia coli* O157:H7 and *Salmonella* in feedlot cattle, evaluating herd-level diagnostic approaches for Johne's disease and bovine viral diarrhea in dairy and beef cattle, and evaluating new production systems to prevent calf scours on Nebraska Sandhills ranches.

I also moderate a weekly meeting of UNL faculty and staff, state and federal regulatory veterinarians, public health officials and others interested in solving animal and public health problems related to animal production systems. Currently, I serve as President of the American Association of Extension Veterinarians and Secretary of the Epidemiology Specialty of the American College of Veterinary Preventive Medicine.

David J. Steffen
Associate Professor, BS, DVM, PhD, ABVP
Diagnostic Pathologist
Director Veterinary Diagnostic Center
Appointment 1.0 FTE Diag Srv

My appointment in the Nebraska Veterinary Diagnostic Center is to serve as the Director and as a Diagnostic Pathologist. The scholarly component involves making use of case materials. A regular funded congenital defects referral center was established and I was actively investigating Dwarfism in Angus in 2002 and worked with Angus and Hereford Associations to update their genetic disease control policies. Collaboration with Dr. Kelling on BVDV infections in calves is ongoing as is collaborative studies in West Nile virus infection in horses. Laboratory accessions continue to rise.

Major time commitment is toward providing administrative guidance to the Diagnostic Center and providing diagnostic and consultation services to the Nebraska livestock industry. I serve as a case coordinator on 1300-1400 investigations per year, which involve a multi-disciplinary approach to disease diagnosis. All cases culminate in a written report to the veterinarian and/or the animal owner, and often telephone consultations regarding disease management.

Subramaniam Srikumaran
Professor, BVSc, MS, PhD
Immunologist
Appointment: 85% Rsch; 15% Tchng

The long term goals of my laboratory are to understand the host-pathogen interactions with the objective of preventing the disease process. We are using bovine herpesvirus 1 (BHV-1) and *Pasteurella haemolytica* as the model systems. BHV-1 is an important primary etiological agent, and *P.haemolytica* the most common secondary bacterial pathogen, of bovine respiratory disease complex, which costs over $500 million to the cattle industry of the United States.

The ability of BHV-1 to undergo latent infection, and induce immuno-suppression presents major difficulties in controlling this infection. Although the currently used modified live virus (MLV) vaccines help to control the clinical disease, they do not help to eliminate the viral infection since the vaccine strains also undergo latency, with subsequent reactivation and shedding of the virus. Furthermore, studies in our laboratory have determined that the vaccine strains, like the wild-type virus, down-regulate the expression of major histocompatibility complex (MHC) class I molecules on bovine cells. Down-regulation of class I molecules by BHV-1 would compromise the development of cytotoxic T lymphocytes (CTLs) against not only BHV-1, but also other viruses. Hence our laboratory is investigating the alternatives for MLV vaccines. In one facet of this project, we are characterizing the down-regulation of class I molecules by BHV-1. Our studies have determined that one or more of the immediate-early proteins is/are responsible for the down-regulation of class I molecules. Our immediate objective is to identify the IE protein(s) responsible for this effect. If this protein(s) turn(s) out to be non-essential for viral replication, a deletion mutant lacking the gene(s) encoding this protein(s) could be tested as a vaccine candidate. Our studies have further determined that interference with the transport of peptides from the cytosol into the endoplasmic reticulum is one of the mechanisms by which BHV-1 down-regulates the expression of class I molecules. Our future studies would be directed towards the detection of any additional mechanisms of down-regulation of class I molecules by BHV-1. In addition to expanding our understanding of the pathogenesis of BHV-1, these studies should help in further elucidation of the molecular events involved in the intricate antigen processing and presentation by class I molecules.

Epitope-based vaccines represent another alternative to the MLV vaccines. Although several neutralizing antibody epitopes of BHV-1 have been identified, not a single CTL epitope has been identified. Hence another facet of this project is directed towards the identification of CTL epitopes of BHV-1, using the allele-specific peptide motifs. We already have tested the feasibility of this approach in the mouse system by identifying three BHV-1 epitopes based on the ASPM of the K^d molecules. In the bovine system, we have identified the ASPM of BoLA-A11, a bovine class I allele expressed in over 25% of milk and beef breeds. Future studies will be addressed towards mapping the CTL epitopes of BHV-1 restricted by BoLA-A11. Other alternatives that are investigated in our laboratory are DNA immunization, and the use of heat shock proteins as adjuvants to direct the CTL peptide epitopes to the class I antigen presentation pathway. The project on *P. haemolytica* involves the identification of the cellular receptor for the leukotoxin which is an important virulence factor of this organism. Our studies have determined that the leukotoxin binds the β_2 integrins on bovine leukocytes. Future studies will be directed towards the confirmation of β_2 integrins as the cellular receptors of the leukotoxin, and elucidation of the role of the subunits of β_2 integrins in leukotoxin binding, and mapping the domains involved in this interaction. These studies should help to understand the pathogenesis of this disease, and pave the way for developing means to prevent the leukotoxin binding of the leukocytes.

Yange Zhang
Research Assistant Professor, BA, PhD
Molecular Biologist
Appointment: 100% Rsch

1. Functional analysis of the bICP0 encoded by bovine herpes virus

Bovine herpes virus 1 (BHV-1) is an important viral pathogen of cattle. Infection of BHV-1 can cause conjunctivitis, pneumonia, genital disorders, abortions and upper respiratory infection referred to as "shipping fever." Infection of permissive cells with BHV-1 leads to rapid cell death. Viral gene expression is temporally regulated in three distinct phases: immediate early (IE), early (E) or late (L). bICP0 is encoded by IE transcription unit 1 (IEtu1). bICP0 activates its own expression as well as E and L transcription units, but represses the other two IE proteins bICP4 and bICP22 promoter activity. This bICP0 is considered as the major viral regulatory protein. bICP0 does not bind DNA and is believed to be a functional homologue of the HSV-1 IE protein ICP0. The only well-conserved domain in the two proteins is a C3HC4 zinc ring finger located near the N terminus of both proteins. Mutational analysis has demonstrated the importance of the HSV-1 ICPO zinc ring finger domain and such domains are believed to be involved in protein-protein interactions.

My research has focused on the characterization of the functional domains of bICP0. In transiently transfected cells, bICP0 is toxic, but does not appear to directly induce apoptosis. The C-terminal sequences in the last 320 amino acids of bICP0 mediated subcellular localization. Mutagenesis analysis indicated that the zinc ring finger domain of bICP0 was important for transcriptional activation of TATA box containing promoter. In vivo, bICP0 interacted with multiple basal transcriptional factors to activate transcription. bICP0 also interacted with the histone deacetylase 1 (HDAC1), which resulted in inhibiting Mad dependent transcriptional repression. Future studies will focus on whether bICP0 is involved in chromatin remodeling by affecting the acetylation of histones.

2. Fumonisin

Fumonisin B_1 (FB_1) a mycotoxin produced by the phytopathogenic fungus *Fusarium moniliforme*, structurally resembles sphingoid bases. FB_1 perturbs sphingolipid synthesis by inhibiting the activity of ceramide synthase. Ingestion of FB_1 causes equine leukoencephalomalacia and porcine pulmonary edema. It is also carcinogenic to rodents and associated with certain human cancers. Since the fungus is a common inhabitant of both healthy and diseased cereal grains, this toxin maybe an important health threat. Our studies showed that FB_1 treatment of CV-1 cells altered cell cycle related proteins expression and led to cell cycle arrest and apoptosis. We also used a PCR-based subtraction approach to identify nine genes which showed high similarity (>90%) to known mammalian genes. Those genes are involved in diverse signal transduction pathways. The ability of FB_1 to alter gene expression may be necessary for its carcinogenic and toxic effects. Future studies will establish the association of FB_1 toxicity with the altered gene expression.

Y. "Joe" Zhou

Research Associate Professor, BSc, PhD

Cell Biologist

Manager, Microscopy Core Research Facility

Center for Biotechnology

Appointment: 70% Managing & Srv; 20% Rsch and 10% Training & Tchg

As the Manager of Microscopy Research Core Facility of Center for Biotechnology, my main goal has been to establish and maintain the-state-of-art microscopy imaging facility, which provides instrumentation and expertise to researchers within and outside UNL. I am also actively involved in research collaborations and in providing technical support for seeking research funding. One of the major research and service projects involves the use of immunochemical labeling and digital imaging technology to support an NIH-funded collaborative study of viral pathogenesis by a group of scientists from UNL, UNMC and UNC. Microscopy imaging technologies we provide include: a) single/double/triple labeling immunofluorescence microscopy using whole tissues or sections, b) multi-probe in situ hybridization, c) real-time imaging confocal microscopy (i.e. detection of GFP-tagged proteins in live cells in cultures and d) transmission and scanning electron microscopy.

My research is focused on genetic and environmental effects on stress responsiveness in relation to age-related neurodegeneration using animal models. One of the ongoing projects, in collaboration with Dr. MK Nielsen of Animal Sciences, is genetic selection of mouse lines with high and low responsiveness to stress, in order to establish a useful mouse model of stress-induced early aging and neurodegeneration. It is well known that in addition to genetic factors, chronic stress plays an important role in age-related neurodegenerative disease. Progressive disruption of both the neuroendocrine and immune systems has been correlated with the age-associated pathogenesis in humans and in animal models. Mechanisms responsible for abnormal neuroendocrine activities in response to stress are still far from clear. Dysfunction of the central regulation of stress response and disruption of the CNS neurochemical pathways may be a direct consequence of the decreased neuronal plasticity and progression of central neuronal apoptosis and degeneration. We have shown that the abnormalities found in chronically stressed mice lacking apolipoprotein E correlate to the alternations of the functional integrity of the HPA axis. We will use our mouse model to examine the effects of chronic stress and aging on central neurochemical activities in relation to altered serum concentration of steroids. This research will provide a new perspective on the neurobiological and neurochemical regulation of stress response and stress adaptation mechanisms.

● VBMS RESEARCH ASSOCIATES - PROFILES ●

Name **Subash C. Das** Place of Birth Orissa, India
Mentor Asit K. Pattnaik Arrival in US May 29, 2001
Degree(s) **BSVc** - September 1987 - College of Veterinary Science, Orissa, India (Veterinary Science & A. H.)
MVSc - 1991 - Ivro, Izatnagar, U.P. India (Veterinary Immunology)
PhD - 2000 - University of London, Surrey, U.K. (Veterinary Molecular Virology)

Name **Shuanghu Liu** Place of Birth Hunan, China
Mentor Asit K. Pattnaik Arrival in US June 29, 2001
Degree(s) **BS** - June 30, 1986 - Zhongshan Medical University, Guangzhou, China (Medical)
MD - June 30, 1991 - Hunan Medical University, Hunan, China (Hepatology and Infectious Diseases)
PhD - June 30, 1995 - Hunan Medical University, Hunan, China (Hepatology and Infectious Diseases)

Name **Weiping Peng** Place of Birth China
Mentor Clinton J. Jones Arrival in US June 7, 2001
Degree(s) **BS** - July 25, 1982 - Anhui Agricultural University - China (Sericulture)
MS - December 26, 1986 - Anhui Agricultural University - China (Silkworm genetics and breeding)
PhD - March 4, 2000 - Chinese Academy of Agricultural Sciences, China (Silkworm genetics and breeding)

Name **M. Rohan Fernando**[2] Arrival in US October 8, 2001
Mentor Marjorie F. Lou Place of Birth Chilaw, Sri Lanka
Degree(s) **BS** - August 28, 1980 - Mentor of Science, University of Peradeniya, Sir Lanka (Biology)
MSc - May 28, 1985 - Post Graduate Institute of Agriculture, University of Peradeniya (Food Science/Nutrition)
PhD - March 25, 1994 - Kynshu University School of medicine, Japan (Molecular Biology/Biochemistry
M.Phil - August 30, 1989 - Mentor of Medicine, University of Ruhuna, Sri Lanka (Biochemistry)

Name **Svetlana P. Yegorova**[2] Place of Birth Ukraine
Mentor Marjorie F. Lou Arrival in US November 19, 2000
Degree(s) **BS** - May 30, 1985 - Keiv State University, Kiev, Ukraine (Biophysics)
MS - June 15, 1987 - Kiev State University, Keiv Ukraine (Molecular Biology)
PhD - May 18, 1999 - Institute of Molecular Biology and Genetics, NASU, Keiv, Ukraine (Molecular Biology)

Name	**Sung-chur Moon**[2]	Place of Birth	Pusan, Korea
Mentor	Marjorie Lou	Arrival in US	February 27, 2001
Degree(s)	**MD** - February 1994 - Dong-A University School of Medicine - Korea (Ophthalmology: cataract and Refractive surgery)		
	PhD - February 2002 - Dong-A University School of Medicine - Korea (Retina)		

Name	**Melissa Inman**[2]	Place of Birth	Connecticut
Mentor	Clinton J. Jones	Arrival in US	US Citizen
Degree(s)	**BS** - May 10, 1990 - University of Connecticut, Connecticut (Pathobiology)		
	MS - May 10, 1996 - University of Connecticut, Connecticut (Pathology/Immunology)		
	PhD - December 22, 2002 - University of Nebraska Medical Center, Lincoln, NE (Molecular Biology of Viruses)		

Name	**Kuiyi Xing**	Place of Birth	Jiangsu Province, PRC
Mentor	Marjorie F. Lou	Arrival in US	July 10, 1996
Degree(s)	**BS** - July 15, 1991 - Fudan University, Shangaahi, People's Republic of China (Biochemistry)		
	PhD - December 20, 2002 - University of Nebraska-Lincoln (Biochemistry)		

University of Nebraska Lincoln

INSTITUTE OF AGRICULTURE AND NATURAL RESOURCES
COLLEGE OF AGRICULTURAL SCIENCES AND NATURAL RESOURCES
Office of the Dean

November 13, 2003

TO: IANR Faculty Involved in CASNR Instruction/Advising

FROM: Steve Waller
Dean

SUBJECT: ***Academic Appointment Summary***

Enclosed is a summary of your calculated FTE for the 2002-2003 academic year (Fall 2002, Spring 2003, Summer 2003). This is a measure of effort, not quality of instruction or advising. The CIEQ, Peer Review and Student Outcomes Assessment provide opportunities to address quality. The documentation for the Academic Appointment is on the CASNR website at http://casnr.unl.edu/facstaff/forms.htm

We have developed a format for the academic appointment summary that identifies the contributions of each category (Advising, Adjustments and Instruction) to the total calculated FTE. If you are on an academic year appointment, the calculated FTE has been adjusted. The budgeted FTE is taken from the 2002-2003 Departmental Budget Listing and will not reflect changes made after April 1, 2002. Mid-year adjustments in your budgeted FTE are considered during the evaluation process. Also enclosed is your historical summary for total calculated FTE. Please contact Associate Dean Jack Schinstock if you have any questions about the enclosures.

This year we requested the *Academic Appointment Information Sheet* earlier and independent of your ARFA submission. Our goal was to provide this summary prior to your submission of your ARFA. Unfortunately, this was not possible this year.

Although completing the *Academic Appointment Information Sheet* is time consuming and may appear more bureaucratic than necessary, it has proven to be very accurate College-wide. It allows you, your unit administrator and the College to make knowledgeable decisions regarding workload adjustment and resource allocation. As helpful as it is within the College, its benefit is even greater when campus administration is evaluating academic appointments across colleges.

CASNR is the only college with substantial quantitative documentation. Our process acknowledges important components of the academic appointment that cannot be measured by student credit hour production alone. Consequently, the data that you help us collect has greatly strengthened our position in discussing faculty load among the other colleges. For that I am grateful and appreciate your time and effort invested in helping us each year with this activity.

Encl: Academic Appointment Summary (2002-2003)
Academic Appointment History

cc: IANR Deans' Council w/o encl.

103 Agricultural Hall / P.O. Box 830702 / Lincoln, NE 68583-0702 / (402) 472-2201 / FAX (402) 472-7911 / http://casnr.unl.edu

Veterinary and Biomedical Sciences Trend
10-Year Report

Calculated FTE[1]

Name	93-94	94-95	95-96	96-97	97-98	98-99	99-00	00-01[2]	01-02	02-03		Comments
	Calculated FTE	Calculated FTE	Calculated FTE	Calculated FTE	Calculated FTE	Calculated FTE	Calculated FTE	Calculated FTE	Calculated FTE	Calculated FTE[2]	Budgeted FTE[3]	
Barletta	12	22	13	20	15	13	12	13	11	9	10	
Cirillo					17	17	22	13	16	21	15	
Donis	25	24	26	25	12	12	28	23	20	17	30	
Duhamel	31	19	20	10	5	3	3	8	9	8	10	
Ebako									8	0	25	hired 2-6-02
Jones	0	10	18		13	18	18	16	29	14	10	
Kelling	9	9	23	16	21	29	32	35	39	40	15	.35 FTE 7-1-02
Moxley			10	16	15	28	16	25	15	18	10	
Schmitz	31	26			20	32	31	33	31	37	8	
Schneider	52	40	53	55	53	54	63	59	0	42	50	Retired 12-31-02
Srikumaran	19	24	18	30	14	22	18	5	10	15	15	
Sub-Total								230	188	221	198	
Contract/Other Teaching Faculty												
Brodersen										1	0	
Doster								1	0	1	0	
Hinkley										1	0	
Lou			31		20	13	13	15	19	8	0	NRI (.1 FTE)
Osorio			6		5	11	9	14	6	7	0	
Pattnaik										4	0	
Rogers								2	1	2	0	
Smith								0	1	0	0	
Steffen								0	0	5	0	
Zhou										1	0	
TOTAL									**261**	**251**	**198**	

[1] The CASNR Academic Appointment - Philosophy and Guidelines (September 2003)
[2] Based on Fall 2002, Spring 2003, Summer 2003
[3] Fiscal Year 2002-2003, Departmental Budget Listing

● VBMS TEACHING PROGRAM ●

VETERINARY AND BIOMEDICAL SCIENCES DEPARTMENT COURSES

Course #	Course Title Cross listing	Credit Hours, Semester
VBMS 101	Introduction to Animal Health Careers	1 cr, I
VBMS 303	Principles and Prevention of Livestock Diseases	3 cr, II
VBMS 403	Integrated Principles and Prevention of Livestock Diseases	4 cr,
VBMS 408	Functional Histology Lec 2, lab 2	4 cr, II
VBMS 410	General Pharmacology and Toxicology	3 cr, II - Lec 3
VBMS 416	Veterinary Entomology/Ectoparasitology (ASCI, ENTO, NRES 416/816)	2cr, II
VBMS 424	Basic Molecular Infectious Diseases	3 cr, II, even numbered yrs
VBMS 441	Pathogenic Microbiology (BIOS 441/841)	3 cr, II
VBMS 452	Introduction to Molecular Virology and Viral Pathogenesis	3 cr, I
VBMS 488	Exploration of Production Medicine	2 cr, III - Lec 2
VBMS 496	Independent Study in Veterinary Science	1-5 cr, I, II
VBMS 499H	Honors Thesis	3-6 cr, I, II, III
VBMS 805	Introduction to Mechanisms of Disease	3 cr, II
VBMS 808	Functional Histology	4cr, II Lec/Lab
VBMS 811	Introduction to Veterinary Epidemiology	2 cr, III - Lec/Disc/Lab
VBMS 816	Veterinary Entomology/Ectoparasitology	2 cr, II
VBMS 816L	Veterinary Entomology/Ectoparasitology	1 cr, I
VBMS 818	Computer-aided Sequence Analysis Primer	2 cr, I
VBMS 820	Molecular Genetics (420/820) (BIOS 820)	3 cr
VBMS 824	Basic Molecular Infectious Diseases	3cr, II
VBMS 835	Animal Biochemistry (BIOS 835)	3 cr, II
VBMS 838	Molecular Biology Laboratory (BIOS 838)	5 cr, III
VBMS 840	Microbial Physiology (BIOS 840)	3 cr

Course #	Course Title Cross listing	Credit Hours, Semester
VBMS 841	Pathogenic Microbiology (BIOS 841)	3 cr, II Lec/Lab
VBMS 842	Endocrinology (ASCI 842, BIOS 842)	3 cr, I
VBMS 843	Immunology (BIOS 843)	3 cr
VBMS 845	Animal Physiology I (ASCI 845, BIOS 813)	4 cr, I Lec/Lab
VBMS 846	Animal Physiology II (ASCI 846, BIOS 814)	4 cr, II
VBMS 847A&B	Interdisciplinary Concepts in Beef Production	4 cr, I, II
VBMS 848	Introduction to Veterinary Biotechnology	1-2 cr, II
VBMS 852	Introduction to Molecular Virology and Viral Pathogenesis (BIOS 852)	3 cr, I
VBMS 899	Masters Thesis	6-10 cr , I, II, III
VBMS 901	Diagnostic Techniques	1-10 cr, I, II
VBMS 909	Seminar	1-4 cr, I, II
VBMS 919	Regulation of Eukaryotic Gene Expression	3 cr, II
VBMS 920	Measurement of Animal Disease and Production	2 cr, I
VBMS 921	Analytic Observational Studies in Veterinary Epidemiology	2 cr, I
VBMS 925	Critical Reading of the Epidemiology Literature	1-6 cr, II
VBMS 930	Advanced Food Animal Production Medicine	2 cr, II (even yrs)
VBMS 942	Microbial Genetics	3 cr
VBMS 944	Immunovirology (BIOS 944)	3 cr
VBMS 948	Concepts in Experimental Immunology (BIOS 948)	3 cr, II
VBMS 949	Vaccinology	3 cr, II, alternate yrs
VBMS 950	Medical Molecular Virology (BIOS 950)	3 cr, I
VBMS 951	Advanced Molecular Infectious Disease	3 cr, II
VBMS 964	Signal Transduction (BIOS 964)	3 cr
VBMS 966	Advanced Viral Pathogenesis (BIOS 966)	3 cr (alternate yrs)
VBMS 975	Seminar in Veterinary Histopathology	1 cr, I, II
VBMS 996	Research on Selected Problems in Veterinary Science	1-10 cr, I, II
VBMS 998	Special Topics in Veterinary Science	1-10 cr, I, II
IBMS 999	Doctoral Dissertation	1-10 cr, I, II, III

Enrollment VBMS Courses, 2003

Spring, Semester, 2003

Course #	Course Title	Instructor	Students	Cr Hrs
VBMS 303	Livestock Diseases	Kelling	35	105
VBMS 403	Livestock Diseases	Kelling	16	64
VBMS 403H	Livestock Diseases (Honors)	Kelling	1	4
BIOS 408	Functional Histology	Schmitz	3	12
VBMS 408	Functional Histology	Schmitz	21	84
VBMS 441	Pathogenic Microbiology	Moxley	14	42
BIOSCI 441	Pathogenic Microbiology	Moxley	9	27
VBMS 496	Independent Study	Cirillo	1	2
VBMS 496	Capstone:Issues Animal Health	Kelling	1	1
VBMS 808	Functional Histology	Schmitz	1	4
VBMS 811	Vet Epidemiology	Smith	1	2
BIOS 816	Sequence Analysis Primer	Donis	16	32
VBMS 818	Sequence Analysis Primer	Donis	7	14
VBMS 824	Molecular Diseases	Barletta/Cirillo	4	12
BIOS 841	Pathogenic Microbiology	Moxley	8	24
MSIA 899	Masters Thesis	Staff	1	1
VBMS 899	Masters Thesis	Staff	12	55
VBMS 901	Diagnostic Technique	Doster	1	2
VBMS 909	Seminar	Schmitz	27	27
VBMS 944	Immunovirology	Srikumaran	8	24
VBMS 996	Research Problems	Staff	12	42
MSIA 999	Doctoral Dissertation	Staff	3	17

First Five-Week Summer Session, 2003

Course #	Course Title	Instructor	Students	Cr Hrs
VBMS 496	Independent Study	Schmitz	1	2
VBMS 899	Masters Thesis	Staff	9	23
VBMS 901	Diagnostic Technique	Doster	1	2
VBMS 996	Research Problems	Staff	12	32
MSIA 999	Doctoral Dissertation	Staff	1	1

Second Five-Week Summer Session, 2003

Course #	Course Title	Instructor	Students	Cr Hrs
VBMS 496H	Independent Study	Cirillo	1	1
VBMS 899	Masters Thesis	Staff	10	26
VBMS 996	Research Problems	Staff	13	34
VBMS 998	Beef Production Records	Staff	1	2
MSIA 999	Doctoral Dissertation	Staff	1	1

Fall Semester, 2003

Course #	Course Title	Instructor	Students	Cr Hrs
UNF101	Student Life Seminar	Schneider	15	30
VBMS 101	Animal Health Careers	Schneider	44	44
VBMS 410	Gen Pharmacology & Toxicology	Carlson	17	68
VBMS 496	Independent Study	Smith	2	2
VBMS 899	Masters Thesis	Staff	7	23
VBMS 909	Seminar	Schmitz	25	25
VBMS 950	Medical Molecular Virology	Donis/Jones	7	21
VBMS 998	Research Problems	Staff	13	54
VBMS 998	Feedlot Comparative Outcome	Griffin	1	1
VBMS 998A	Feedlot Health Management	Griffin	2	6

● UNDERGRADUATE ENROLLMENT ●

2003 Spring Semester Enrollment

Veterinary Science Major	117
Pre-Veterinary Medicine Major	8
Veterinary Technician Major	15

2003 Fall Semester Enrollment

Veterinary Science Major	110
Pre-Veterinary Medicine Major	14
Veterinary Technician Major	8

Pre-Veterinary Student Peer Advisors

Spring, 2003

Megan Becher
Beth Kilzer
Amanda Willers

Fall, 2003

Pam Fry
Beth Kilzer
Jeff Korus
Meggan Kroeker
Abby Obermiller

UNDERGRADUATE DEGREES OBTAINED

May 2003

Name	Major
Kathryn Abel	Veterinary Science
Jeramie Abel	Veterinary Science
Michelle Backlund	Veterinary Science
Megan Becher	Veterinary Science
Allison Eitzmann	Veterinary Science
Melissa Haase	Veterinary Science
Erin Jizba	Veterinary Science
Cody Knisley	Veterinary Science
Travis Nienhueser	Veterinary Science
Mikiko Oka	Veterinary Science
Melissa Snyder	Veterinary Science
Erica Spenner	Veterinary Science
Lindsey Stevens	Veterinary Science
Nicole Svehla	Veterinary Science
Justin Villafane	Veterinary Science
Amanda Willers	Veterinary Science

August 2003

Name	Major
Heather Joy	Veterinary Technology
Amber Olson	Veterinary Technology

December 2003

Name	Major
Theresa Jack	Veterinary Science
Jennifer Jaderborg	Veterinary Science
Lindy Echtenkamp	Veterinary Technology
Christopher Friedel	Veterinary Technology
Kari Schmieding	Veterinary Technology
Adam Woods	Veterinary Technology

Undergraduate Advisor: Dr. David Steffen

●VBMS Undergraduate Majors on CASNR Dean's List ●

Spring Semester 2003

Veterinary Sciences Majors

Michelle Backlund
Jordan Bader
Rachel Battiato
Megan Becher
Benjamin Britten
Caressa Cantrell
Allison Eitzmann
Pamela Fry
Yoshiaki Hasegawa
David Heftie
Kristina Holt
Joshua Howard
Emily Humphrey
Pamela Karakusis
Sarah LaPatka
Yuko Mori
Laura Pike
Holly Samson
Lindsey Stevens
Justin Villafane

Fall Semester 2003

Veterinary Science Major

Donna Bader
Benjamin Britten
Caressa Cantrell
Jeffery Eihusen
Elizabeth Farrow
Pamela Fry
Jennafer Glaesemann
Nicole Hanson
Kristina Holt
Meggan Kroeker
Abby Obermiller
Laura Painter
Michelle Pavelka
Jason Pieper
Trisha Rucker
Sara Schuessler
Angela Shemek
Maria Sonderegger
Carol Sutton
Abby Van Hoef
Rebecca Woolard
Leann Wrigh

Nebraska Residents Enrolled in KSU CVM, Academic Year 2003 (5/03-4/04B)					
Name	Class	Name	Class	Name	Class
Beerenstrauch, Mark	2004	Fleischacker, Rachel	2005	Rath Fatima	2006
Buhr, Peter	2004	Gdanitz, Justin	2005	Longfellow, Daniel	2006
Church, Ryan	2004	Gladney, Jason	2005	Rowan, Jennifer	2006
Dowdell (Cent), Alana	2004	Hauser, Donovan	2005	Skavdahl, Elizabeth	2006
Furman, Thomas	2004	Hruby, Jennifer	2005	Smith, Eliza	2006
Hafer (Keener), Bobbi	2004	Irvin, Katherine	2005	Stahl, Matthew	2006
Hastings, Christy	2004	Johnson, Brad	2005	Stuart, Jeremy	2006
Hiebner (Friesen), Jennifer	2004	Jordan, Will	2005	Sund, Patricia	2006
Horn, Amber	2004	Keiser, Sarah	2005	Thiele, Kevin	2006
Jones, Heather	2004	Knope, Jennifer	2005	Tolstedt, Calvin	2006
Knudsen, Shelly	2004	Lee, David	2005	Tuller, Eric	2006
Kurz, Lance	2004	Livengood, Mary	2005	Jeremy Young	2006
Landen, Meghan	2004	Luebbe, Bradley	2005	Backlund, Michelle	2007
Lovelace, Karen	2004	McGreer (Whitworth), Brandy	2005	Becher, Megan	2007
McGrath, Erin	2004	Mohr, Catherine	2005	Bessmer, Aaron	2007
McInteer, Patrick	2004	Panko, Lee	2005	Bockelman, Toni	2007
Placke, Keith	2004	Patera, Kimberly	2005	Buschkamp, Nicholas	2007
Schnell, Roy	2004	Pohlman (McFee), Renee	2005	Cole, Jeremiah	2007
Schreurs (Schanou), Katherine	2004	Strongin, Sara	2005	Creighton, Amanda	2007
Skavdahl, Joseph	2004	Suda, Shelli	2005	Fellers, Kristen	2007
Spiehs (Grapes), Cynthia	2004	Asche, Leslie	2006	Grosse, Miranda	2007
Tipton, Tad	2004	Bangert, Alicia	2006	Heftie, David	2007
Warnes, Cynthia	2004	Carpenter (Spurgin) Rebecca	2006	Jirovsky, Lynn	2007
Wright, Lynde	2004	Choma, Kimathi	2006	Knisley, Cody	2007
Brandt, Aric	2005	Crumly, Lindsey	2006	Larson, Aaron	2007
Branek, Belinda	2005	DiMari, Joseph	2006	Leach, Tiffany	2007
Brester, Jill	2005	Ditmars, Nora	2006	Nelms, Melody	2007
Butterfield, DaLean	2005	Hartmann, Erica	2006	Nienhueser, Travis	2007
Chytka, Brandi	2005	Jones, Stephanie	2006	Olson, Emily	2007
Ellis, Daniel	2005	Kaliff, Melody	2006	Rainwater, Kimberly	2007
Emanuel, Sara	2005	Karlin, Wm. Mike	2006	Schmid, Luke	2007

Nebraska Residents Enrolled in KSU CVM, Academic Year 2003 (5/03-4/04B)					
Stevens, Lindsey	2007	Willers, Amanda	2007		
Stones, Allen	2007	Svehla, Nichole	2007		
Thomassen, Michael	2007				
Torpy, Rebecca	2007				

Nebraska Residents that Graduated from Kansas State University May, 2003	
Batenhorst, Lynn	Jordan, Kelly
Belfiore, Megan	Koch, Ryan
Benish, Theresa	Little, William
Brakenhoff, Jeffrey	Longfellow, Todd
Brockmeier, Tirsten	Ramsel, Carin
Buhr, Emily	Schulte (Putnam), Heather
Epp, Dalane	Stoehr, Robin
Fanning (Freehling), Tara	Taylor, Timothy
Frese, Daniel	Tebbe, Sarah
Gissler, Shelly	Walker, Adina
Graham, Jeffrey	Wilcox, Robin
Grant, Amy	Wulf, Keri
Harrington, Ann	

UNL Students Attending Veterinary Colleges Other Than Kansas State University		
Name	Pre-Vet Curriculum Completed	Admitted to
Katherine Abel	University of Nebraska-Lincoln	Ross University
Caleb Harms	University of Nebraska-Lincoln	Colorado State University
Lisa Reich	University of Nebraska-Lincoln	Ross University

Graduate Students (MS) Advised by VBMS Faculty

MS Candidate/Advisor	Program	Research Project
Jenna Achenbach BA, Drake University, Cedar Rapids, IA (Clayton Kelling)	MS, VS* Option I	Studies on BVDV RNA
Ryan Brady BS, University of NE (Clayton Kelling)	MS, VS* Option I	Immune responses to recombinant attachment protein of bovine respiratory syncytial virus
Monica Brito DVM, Universidade Paulista, Brazil (Fernando Osorio)	MS, VS* Option I	Development of diagnostic reagents for Porcine Circovirus type 2
William Brockway BS, DVM, University of Minnesota (Dee Griffin)	MS, VS* Option III	Pleural strip lesions at slaughter and pneumonia in cattle
Harpreet Chahal BVSc, Punjab Ag University, India (Raúl Barletta)	MS Option I	Alanine metabolism in mycobacteria
Nicole Clark BS, University of NE (Rodney Moxley)	MS, VS* Option I	Role of the *Escherichia coli* I87 capsule in serum and phagocyte resistance
Holly (Daniels) Klink BS, University of NE (Clayton Kelling)	MS, VS* Option I	Studies on BRSV fusion protein
Roger Ellis BS, DVM, Colorado State University (Gary Rupp)	MS, VS* Option I	Evaluation of fertility and reproductive efficiency of yearling beef bulls utilized in a rotational multi-sire natural mating system
Boyoung Hong BS, Pukyong National University, Korea (Gerald Duhamel)	MS, VS* Option I	Evaluation of glucose/galactose and serine/ Arginine in *Brachyspira* chemotaxis
James Kennedy BS, Fort Hays State University DVM, University of MO (D. Dee Griffin)	MS, VS* Option III	The development of a pooled fecal culture method to determine herd prevalence of *M. Avium paratuberculosis* in beef cattle
In-Kyung Kim DVM, Kyungpook Nat'l University Korea (Fernando Osorio)	MS, VS* Option I	Immune response to PRRSV virusin non-swine hosts
Lawrence Moczygemba BS, DVM, Texas A&M Galveston, TX (Gary Rupp)	MS, VS* Option III	Persistently infected BVD calves in feedlots
Dhammika Navarathne BVSc, University of Peradeniya, Sri Lanka (G. Duhamel)	MS, VS* Option I	Effect of farnesol on *Candida albicans* infection in a mouse model
Melissa Rice BS, South Dakota State University, Brookings, SD (Gerald Duhamel)	MS, VS* Option I	Characterization of group A bovine rotavirus P protein antigenic epitopes

MS Candidate/Advisor	Program	Research Project
Michael Wells DVM, Iowa State University, Ames, IA (D. Dee Griffin)	MS, VS* Option III	Performance loss in feedlot cattle associated with disease problems
Ruilin Zhang BM, Beijing Medical University, China (Gerald Duhamel)	MS, VS* Option I	Identification and characterization of *Brachyspira pilosicoli* acid-regulated outer membrane protein antigens

Graduate Student (PhD) Advised By VBMS Faculty

PhD Candidate/Advisor	Program	Research Project Title
Aruna Ambagala BVSc, University Peradeniya, Sri Lanka (S. Srikumaran)	PhD, VS* Option I	Down-regulation of MHC class I expression by bovine herpesvirus 1
Gustavo Bretschneider DVM, University of Nacional de Buenos Aires, MS, National University of Mar Del Plata, Argentina (Rodney Moxley)	PhD Option I	Immune responses to *Escherichia coli* O157:H7 in cattle and role in protection
Marilyn (Buhman) Corbin BS, South Dakota State DVM, Univ of Minnesota; MS, West Texas A&M (D. Dee Griffin)	UNMC**, MSIA Option I	Risk assessment of pulmonary lesions in fed cattle and evaluation of risk factor based health management strategies
Rohanna Dassanayake DVM, Univ. of Peradoniya, India MS, University of Nebraska-Lincoln (Gerald Duhamel)	PhD, VS* Option I	Mechanism of *Brachyspira pilosicoli* trafficking inside macrophage
Joseph Erume DVM, Makerere University, Uganda MS, University of London (Rodney Moxley)	PhD, VS* Option I	Influence of enterotoxins and capsule on colonization of the porcine intestine by enterotoxigenic *Escherichia coli*
Vicki Geiser BS, MS, University of NE-Lincoln (Clinton Jones)	UNL, BioSci*** Option I	Regulation of productive infection by the bovine herpesvirus 1 encoded bICPO
Laura Gil DVM, Fundacao de Ensina, Brazil MS, University Federal de Santa Maria (Ruben Donis)	PhD, VS* Option I	Studies on the permissiveness and responses of bovine cells to BVDV infection
Hailong Guo BS, Yangzhou University, China (Fernando Osorio)	PhD, VS** Option I	Protective immunity against Porcine Reproductive and Respiratory Syndrome Virus
Manirath Khounlotham BSc, University of Montpellier II, France; MSc, University of Paul Sabatier-Toulouse II, France (Jeffrey Cirillo)	PhD, VS* Option I	Molecular Analysis of Mycobacteria Pathogenesis 1
Byung Kwon DVM, MS, Kon Kuk University Seoul, Korea (Fernando Osorio)	PhD, VS* Option I	Immunopathogenesis of porcine reproductive respiratory syndrome virus
Namal Liyanage BA, University of Sri Lanka (Marjorie Lou)	PhD, VS* Option I	Oxidation damage repair enzymes: Thioredoxin and its regulation in the lens epithelial cells
Debasis Nayak BVSc, Orissa Vet College, India MVSC, Maras Vet College, India (Asit Pattnaik)	PhD, VS* Option I	Porcine reproductive and respiratory syndrome virus replication and pathogenesis

PhD Candidate/Advisor	Program	Research Project Title
Sandra Perez DVM, Faculty of Vet Science, Argentina MS, Faculty of Agrarian Science, Argentina (Clinton Jones)	PhD, VS* Option I	Bovine herpesvirus-1 induced pathogenesis
Christina Topliff BS, DVM, Kansas State University, Manhattan, KS (Clayton Kelling)	PhD, VS** Option I	Bovine viral diarrhea virus (BVDV) virulence determinants
Ling Yan BM, MS- Fudan University, China (Jeff Cirillo)	PhD, BioSci*** Option I	Cell biology of legionella neumophila infections

* Master of Science in Veterinary Sciences, UNL
** PhD in Medical Sciences, Department of Veterinary and Biomedical Sciences, University of Nebraska-Lincoln
*** PhD in Biological Sciences, UNL

● Graduate Degrees Obtained in 2003 ●

MS Degrees

Jenna Achenbach, B.A. (Dr. Clayton Kelling) (May)
"Quantification of viral mRNA in cells infected with bovine viral diarrhea virus and bovine respiratory syncytial virus using real-time quantitative and competitive RT-PCR"

Ryan Brady, B.S. (Dr. Clayton Kelling) (May)
"Expression and immunogenicity of plasmid DNA encoding the attachment (G) glycoprotein of bovine respiratory syncytial virus"

In-Kyung Kim, B.S. (Dr. Fernando Osorio) (May)
"Use of competitive/blocking enzyme immunoassays to detect possible presence of antibodies anti-PRRSV in non-swine species"

Ruilin Zhang, B.S. (Dr. Gerald Duhamel) (August)
"Comparative analysis of membrane proteins of human and animal Brachyspira species"

Monica Brito, DVM (Dr. Fernando Osorio) (December)
"Development of diagnostic tests for the detection of porcine circovirus infection"

Nicole Clark, BS (Dr. Rodney Moxley) (December)
"Analysis of the porcine humoral immune response to *Escherichia coli* K87 polysaccharide"

James Kennedy DVM (Dr. Gary Rupp) (December)
"Methology and computer modeling of pooled fecal cultures to determine herd status of Johne's disease in beef cattle"

Holly Klink, BS (Dr. Clayton Kelling) (December)
"N-linked glycosylation of the fusion (F) glycoprotein of bovine respiratory syncytial virus: influence on function in mammalian cells and antibody response in BALB/c mice"

Lawrence Moczygemba, DVM (Dr. Gary Rupp) (December)
"The effect of persistent infection of bovine viral diarrhea on feedlot morbidity and gain"

Dhammika Navarathna, BVSc (Dr. Gerald Duhamel) (December)
"Role of farnesol in a mouse model of Systemic Candidiasis"

Cristina Persa, M.D. (Dr. Marjorie Lou) (December)
"The presence of the cystathionine beta-synthase in the eye"

Michael Wells, DVM (Dr. Dee Griffin) (December)
"Determining performance decreases and economic losses associated with morbidity and mortality in a group of feeder calves"

PhD Degrees

Marilyn (Buhman) Corbin, DVM, MS (Drs. Laura Hungerford & D. Dee Griffin)
"Exploration of the association between bovine respiratory disease complex and pulmonary lesions evident at harvest and utilization of risk assessment in the feedyard" (MSIA-UNMC graduate)

VBMS 909 Seminars

Spring Semester, 2003

Jan 13 Dr. Richard Bessen, Medical Microbiology & Immunology, Creighton University, Omaha, NE; *"Routes of prion neuroinvasion following oral infection"* (J. Schmitz)

Jan 27 Dr. Vladimir Yamshchikov, Department of Moelcular Biosciences, University of Kansas, Lawrence, KS; *Flavivirus infectious DNA: implications for vaccine development against West Nile virus and other emerging viral pathogens"* (R. Donis)

Feb 3 Sandra Perez, DVM, MS, PhD candidate, Department of Veterinary and Biomedical Sciences, University of NE; *Analysis of virus-host interactions in the tonsil of calves infected with wild type bovine herpesvirus type 1 or the latency-related mutant"* (C. Jones)

Feb 10 Jenna Achenbach, BA, MS candidate, Department of Veterinary and Biomedical Sciences, University of Nebraska; *"Real-time quantitative and competitive RT -PCR of bovine viral diarrhea virus and bovine respiratory syncytial virus mRNA"* (C. Kelling)

Feb 17 Laura Gil, DVM, MS, PhD candidate, Department of Veterinary and Biomedical Sciences, University of Nebraska; *"BVDV-host cell interactions"* (R. Donis)

Mar 3 Holly Daniels, BS, MS candidate, Department of Veterinary and Biomedical Sciences, University of Nebraska; *"Influence of N-glycans of the fusion protein of bovine respiratory syncytial virus on function in mammalian cells"* (C. Kelling)

Mar 10 Cristina Persa, MD, MS candidate, Medical Sciences Interdepartmental Area, University of Nebraska-Medical Center, Omaha, NE; *The distribution of cystathionine beta-synthase in the eye"* (M. Lou)

Mar 24 Warren Schmidt, MD, PhD, Chief GI/Hepatology Veternas Administration Medical Center, Department of Internal Medicine, University of Iowa College of Medicine, Iowa City, Iowa; *"Oxidants and hepatitis C: The beginning or the end?"* (R. Donis)

Mar 31 Dr. Ye-Shih Ho, Institute of Environmental Health Sciences, Wayne State University, Detroit, MI; *"The physiological role of antioxidant enzymes"* (M. Lou)

April 7 Dr. Rodger Johnson, Professor, Department of Animal Science, University of Nebraska, Lincoln, NE; *"Genetic variation for disease resistance/ susceptibility in pigs: Is there any and can it be exploited?"* (J. Schmitz)

April 14 Byungjoon Kwon, DVM, MS, PhD candidate, Department of Veterinary and Biomedical Sciences, University of Nebraska, Lincoln, NE; *"The immunopathology of porcine reproductive and respiratory syndrome virus (PRRSV) infection in pigs: Quantification of porcine cytokine mRNA expression using real-time PCR"* (F. Osorio)

April 21 Dr. Karen Elkins, Research Biologist/Senior Investigator, Center for Biologics Evaluation and Research, Food and Drug Administration, Rockville, Maryland; *"Protective immunity to intracellular bacteria: Lessons from Francisella Tularensis LVS"* (J. Cirillo)

April 28 Dr. Richard Kuhn, Professor, Department of Biological Sciences, Purdue University, West Lafayette, Indiana; *"Structures of enveloped viruses at high resolution"*

Aug 25 Monica Brito, BS, MS candidate, Department of Veterinary and Biomedical Sciences, University of Nebraska, Lincoln, NE; *"Development of diagnostic tests for the detection of porcine circovirus infection"* (F. Osorio)

Sept 15 Dhammika Navarathna, BVSc, MS candidate, Department of Veterinary and Biomedical Sciences, University of Nebraska, Lincoln, NE; *"Role of farnesol in murine model of hematogenously disseminated Candidiasis"* (G. Duhamel)

Sept 22 Lis Corbellini, DVM, MS, PhD candidate, University Federal RGS, Brazil, Visiting Scholar; *"Reproductive failure in cattle caused by Neospora Caninum, a Brazilian and Nebraskan comparative study"* (F. Osorio)

Sept 29 Roger Ellis, BS, DVM, MS candidate, Department of Veterinary and Biomedical Sciences, University of Nebraska, Lincoln, NE; *"Multi-factorial influences on fertility of yearling beef bulls within multi-sire, natural mating at pasture"* (G. Rupp)

Oct 6 Jean Whichard, DVM, PhD, Molecular Microbiologist, Centers for Disease Control and Prevention, Atlanta, Georgia; *"Multi-drug-resistant Salmonella enterica serotype Newport: Results of NARMS human monitoring 1996-present"* (S. Hinkley)

Oct 13 Joyce Solheim, PhD, Associate Professor, Eppley Institute for Research in Cancer and Allied Diseases, University of Nebraska Medical Center, Omaha, NE; *"Late-stage chaperones for MHC Class I molecules?"* (S. Srikumaran)

Oct 27 Aruna Ambagala, BVSc, MS, PhD candidate, Department of Veterinary and Biomedical Sciences, University of Nebraska, Lincoln, NE; *"Inhibition of transporter associated with antigen processing (TAP) by animal alphaherpesviruses"* (S. Srikumaran)

Nov 3 Barry Fields, Laboratory Section Chief, Centers for Disease Control and Prevention, Atlanta, GA; *"The impact of SARS on the diagnosis of pneumonia etiologies"* (J. Cirillo)

Nov 17 Laura Gil, DVM, MS, PhD candidate, Department of Veterinary and Biomedical Sciences, University of Nebraska, Lincoln, NE; *"Interferon type I response in BVDV infected cells"* (R. Donis)

Nov 24 John Chan, PhD, Department of Medicine, Microbiology and Immunology, Albert Einstein College of Medicine, Bronx, New York; *"Mechanisms of tuberculous persistence"* (J. Cirillo)

Dec 1 Melissa Rice, BS, MS Candidate, Department of Veterinary and Biomedical Sciences, University of Nebraska-Lincoln; *"The characterization of the ractivity of monoclonal antibodies produced against epitopes on VP5* of Group A bovine rotavirus"* (G. Duhamel)

Dec 8 Daniel Perez, PhD, Virginia-Maryland Regional College of Veterinary Medicine, University of Maryland, College Park, Maryland; *"Jumping viruses: How we get the Flu"* (R. Donis)

Departmental Special Seminars

Jan 29 Dr. Anselmo Odeon, Veterinary Pathologist, Animal Health Group, National Institute of Agricultural Technology, Argentina. Candidate for the Veterinary Diagnostic Pathologist position in the Veterinary Diagnostic Center, University of Nebraska-Lincoln; *"Differential diagnosis of neurologic diseases of cattle"*

Mar 28 Dr. Doug Foster, Department of Animal Sciences, University of Minnesota; *"Mechanisms of cellular immortalization"* (Sponsored by Nature Technology Corporation-A Lincoln Business)

Aug 18 Dr. Patricia Desmarchelier, Acting Group Manager, Food Safety and Quality Group Food Science Australia; *"E. Coli O157, Salmonella and red meat production"*

Sept 10 Dr. Melissa Inman, Candidate for Research Assistant Professor, Department of Veterinary and Biomedical Sciences, University of Nebraska, Lincoln, NE; *"Analysis of the genes expressed during Alphaherpesvirus latency"*

Sept 25 Dr. M. Rohan Fernando, Candidate for Research Assistant Professor, Department of Veterinary and Biomedical Sciences, University of Nebraska, Lincoln, NE; *"Some functions of antioxidant enzymes, thioredoxin and thioltransferase, in mammalian cells"*

US Meat Animal Research Center: MARC In-House Seminars

Jan 7 Dr. Ron Christenson - *"Interferon-tau gene regulation"*

Jan 10 Dr. Cal Ferrell - *"Identifying efficient animals"*

Jan 24 Dr. Steven Kappes - *"Current activities and status of MARC"*

Feb 7 Dr. Tim Smith - *"Development and application of DNA technology in cattle"*

Mar 7 Dr. Jeff Vallet - *"Proteomics in domestic livestock"*

Mar 14 Dr. Kendall Swanson - *"Can urea N recycling be altered through different protein supplementation schemes to reduce waste N excretion?"*

Mar 25 Dr. Jong Kim - *"Folate binding during pregnancy in pigs"*

April 4 Dr. Dale Van Vleck - *"Computing challenges to genetic improvement"*

April 9 Dr. Garry Bennett - *"Responses to selection for calving ease"*

April 11 Dr. Dan Miller - *"Yet another modified ADF and NDF protocol"*

April 18 Dr. Terry Arthur - *"Prevalence and characterization of Non-O157 Shiga toxin-producing escherichia coli in commercial beef cattle processing plants"*

April 25 Dr. Harvey Freetly - *"Heifers that differ in their breed composition ratio of Bos indicus and Bos taurus differ in the rate that resting metabolic rate decreases with age"*

April 28 Dr. Ralph T. Wiedmann - *"Rotationally resolved photoionization dynamics of small molecules"*

May 14 Dr. Richard Funston - *"Research projects to address reproductive inefficiencies in the beff industry"*

May 15 Dr. Patrick Kayser - *"The interaction between equine spermatozoa and uterine tissue during in virtro co-culture and the changes in skeletal muscle gene expression during growth"*

June 12 Mr. Mark Allan - *"Integration of genomic, proteomic and metabolomic analyses towards polygene discovery for energy balance in mice"*

July 17 Dr. Nathan Elam - *"Factors affecting performance and efficiency of feed and nutrient utilization in feedlot cattle"*

Aug 5 Dr. David Smith - *"Field investigation on an abortion outbreak in a dairy"*

Sept 12 Dr. Jim Wells - *"Can plant phenolics affect viability of Escherichia coli 0157:H7 in beef animal manure?"*

Sept 26. Fafael Canonenco de Araujo - *"Brazilian agriculture and livestock production"*

Sept 29 Dr. R.W. Ellis - *"Multi-factiorial influences on fertility of yearling beef bulls within Multi-sire, Natural Mating at pasture"*

Oct 3 Luis Gustavo Corbellini - *"Neospora caninum and repeated abortions in bovine"*

Nov 7 Dr. David Smith - *"Clinical trials of vaccination and direct-fed microbials to control of E. Coli O157:H7 in feedlot cattle"*

Dec 3 Stewart Bauck - *"Merial's DNA testing business and the Igenity-L test for the leptin gene in cattle"*

Dec 12 Dr. Jim Keen - *"STEC 0157 and Salmonella enterica prevalence in agricultural fair livestock and persistence in the post-fair environment"*

● Great Plains Veterinary Educational Center ●

Gary P. Rupp, Professor and Director
Great Plains Veterinary Educational Center
DVM, MS, Dip ACT
Theriogenology

One of the primary missions of the Great Plains Veterinary Educational Center (GPVEC) is to provide veterinary medical education in a cooperative agreement between Kansas State University and the University of Nebraska. We have maintained a strong teaching program in the food animal health and production management electives with two remaining faculty members and the assistance of one half time faculty/graduate student position. The professional student training program, developed and maintained in cooperation with the U. S. Meat Animal Research Center which maintains large livestock populations of cattle, sheep, and swine continues to be a desirable rotation for many senior students interested in food animal practice. These herds serve as a major teaching resource, allowing students to participate in much of the routine individual animal health care and specific herd activities that are part of the yearly livestock production cycle.

The clinical electives are first offered to KSU students and any remaining open positions are offered to senior level veterinary students from other accredited colleges of veterinary medicine on a first come first serve basis. We continue to receive more requests for elective rotations to fill these openings from outside the UNL-KSU-MARC program than we are able to accommodate which we believe is an indication of a national educational need for future food animal veterinarians. This year 141 KSU students were enrolled in the special clinical electives and 20 students from other colleges of veterinary medicine also participated, as noted in Table 1.

Our faculty has also been involved with a National Food Animal Task Force to improve the selection, teaching, and training opportunities for students interested in food animal careers. This task force has had a number of meetings to consider several potential changes in the selection process for new students and has initiated requests for changes in current curriculum at KSU that have potential benefits for future students. It is considered desirable to work toward a National Center of Emphasis for training food animal veterinarians in beef cattle production, management, and health. This training could be expanded to include food supply chain management which would expand the area of training beyond that of production management and health to continue to improve our food safety and supply. This task force recognizes that the challenge to improve training in the future will be a constant process and is working on long term plans.

The UNL-KSU curriculum requires a one-week clinical core rotation between the first and second year of professional training which is provided at GPVEC (Exploration of Food Animal Production). A total of 100 students participated in this course over four weeks with 25 students per week, in May and August 2003. This course serves as an introductory clinical week for all students to introduce basic animal husbandry, production management concepts such as nutrition, selection, and important economic considerations in the production cycle of livestock, as well as health care, food safety, animal welfare, and environmental considerations. Students may then elect to return for more in-depth training in other rotations offered as third or fourth year level classes. This permits an introduction to clinical work earlier in the professional curriculum which encourages students with interests in food animal careers to pursue additional learning activities in a progressive manner prior to graduation. It also serves the non-food animal

oriented students with a strong exposure to livestock production practices, food safety, animal welfare, and environmental concerns involving production chain practices. They can be a resource of information to urban populations in the future.

The GPVEC also provides continuing education for graduate veterinarians. The 7th session of the Beef Cattle Production Management Series (BCPMS) was completed in April 2002 with 15 participants representing 8 states. To date, a total of 127 veterinarians from beef cattle practices in 23 states and 2 Canadian provinces have participated in the BCPMS since it began in 1993. The Beef Cattle Production Management Series may be combined with a graduate level course which is cross-listed with the Animal Science Department which is offered in addition to certification. This graduate option may be utilized to fulfill a significant number of graduate credits required for a distance education Option III Master of Veterinary Science Degree. In 2003 a total of six distance graduate veterinarians were participating in this MS program. Out of this group, three veterinarians completed their degrees during the fall semester and received their MS diplomas. There are currently three active distance education graduate students working towards their degree. Distance education classes have been completed through UNL, KSU, and ISU. We will offer the 8th session of BCPMS in 2004 and based on several requests hope to fill the next class and increase the number of distance education graduate students in the Department as well as serving a vital continuing education need for practicing and industry veterinarians. Two animal science graduate students have participated in this program and we expect further interest from other disciplines.

One graduate student, Dr. Marilyn Buhman, competed a PhD in Veterinary Epidemiology in the fall semester and was awarded a diploma. Her thesis involved lung lesions in cattle at processing and possible production relationships.

Research

Dr. Griffin successfully completed the first year of a three year funded research project for development of a pre-harvest version of the USDA-FSIS FAST procedure. This grant was awarded to evaluate antibiotic clearance levels in beef cattle and will be continued over the next two years. A group of animals at the U.S. MARC will be utilized for the trial.

Our resident graduate student, Dr. Roger Ellis, is nearing completion of his Masters project working under the Germ Plasm Evaluation Project at the U.S. MARC evaluating the behavior and breeding activity of a large number of F1 herd bulls of various breeds from yearling through three years of age. This study is unique because DNA parentage data will be utilized to determine the outcome of progeny from the sires exposed.

Extension

The GPVEC is committed to work closely with UNL Extension and improve activities around the state. Contributions to a number of programs through presentations to producers, veterinary associations, industry, student groups, community organizations, and agricultural organizations have been made. Faculty members have worked directly with and consulted with producers, veterinarians, the Nebraska Cattlemen's, and the National Cattlemen's Beef Association in developing and demonstrating computer software and addressing other herd health management related concerns. The GPVEC faculty is actively working to implement Beef Quality Assurance programs.

In July 2002, GPVEC was awarded a $250,000 USDA Higher Education Grant for Integrating Biosecurity Practices into Livestock Production Management on Farms and ranches to Insure a Sustainable and Wholesome Food Supply. This project is in cooperation with Kansas State University and Iowa State

University and is currently underway. The objectives of this project are to: 1) develop and evaluate practical biosecurity educational media; and 2) deliver and assess a biosecurity educational program. The resulting materials will both describe foundation principles of biosecurity and expand these concepts to control specific diseases in beef, dairy and sheep production settings. A key component will be first training agricultural specialists as trainers, who will then have the expertise and materials to cost-effectively disseminate information to a wide audience. This approach has been used successfully to implement Beef Quality Assurance programs, developed by members of this project team.

Another effort in conjunction with the National Cattlemen's Beef Association (NCBA) has been to develop a National Center of Excellence in Beef Cattle Education and Research. This project has evolved somewhat because of the interdisciplinary teaching activity that has occurred in the Beef Cattle Production Management Series and was taken up by the Production Research Committee of the NCBA in an attempt to develop the National Center. Currently, discussion and support from Nebraska Cattlemen (NC), the National Beef Cattle Evaluation Consortium, some leaders in the Agricultural Research Service, and others have made resolutions through the NC and NCBA to move forward in plans to create the Center. Future developments will occur over the next year.

Table 1. Enrollments in Student Electives, 2003-2004

Elective	Number Enrolled*	Universities represented (number of students)
Bovine Reproduction	8	Kansas State University (4) Virginia-Maryland (2) North Carolina State University (1) Louisiana State University (1)
Bull Breeding Soundness	1	Texas A&M University (1)
Calving	14	Kansas State University (12) Oregon State University (2)
Clinical/Calving	5	Kansas State University (3) Minnesota State University (1) Oklahoma State University (1)
Clinical Practicum	2	Virginia-Maryland (2)
Feedlot Production Management and Health Consulting	18	Kansas State University (9) University of Minnesota (4) Virginia-Maryland (2) North Carolina State University (1) Louisiana State University (2)
Pregnancy Examination	8	Kansas State University (8)
Exploration of Food Animal Production†	100	Kansas State University (100)
Lambing	5	Kansas State University (5)
Total Enrollment	161	

*The College of Veterinary Medicine (CVM) at Kansas State University (KSU) operates on a May-to-May academicYear, thus enrollment figures are reported for May 2003-May 2004.

†Required rotation for KSU Sophomores

Table 2. GPVEC Student Electives, 2003-2004

(All student electives are one week in length)

Electives	Offered	Date
Clinical Practicum	32 weeks	Available Upon Request
Bovine Reproduction	1 week	October
Bull Breeding Soundness	1 week	April
Calving	4 weeks	March
Clinical/Calving	2 weeks	March, April
Feedlot Management and Consulting	5 weeks	February, October
Pregnancy Examination	2 weeks	October
Exploration of Food Animal Production	4 weeks	May, August
Lambing	3 weeks	January, February, March,
Special Studies		Available Upon Request

Table 3. GPVEC Continuing Education Seminars 2003

CowCalf5 Herd Health Record System Software

Seminar Dates	Participants
January 24, 2003	8
June 25-26, 2003	3

Integrating Biosecurity Practices into Livestock Production Management Seminars

August 19, 2003	29	North Platte
August 21, 2003	41	York

● VBMS RESEARCH PROGRAM ●

All Department faculty are involved in some research activity, either as project leaders or as contributors to research teams. Some faculty members have designated appointments in research. As a part of this appointment, they prepare research project descriptions which are peer-reviewed through a process established by the Agricultural Research Division (ARD) and assigned ARD Research Project numbers. Through an extension of this same process, projects can be approved by the USDA Cooperative State Research Services for matching federal funds, including Hatch, Regional Research or Animal health Research Formula Funds. As a matter of USDA policy, competitive research grants from the USDA are assigned separate ARD project numbers. Several projects are assigned ARD numbers for administrative and budget management purposes even though they are not specifically research projects, e.g., the Nebraska SPF Swine laboratory project (NEB 14-029) and the Nebraska Veterinary Diagnostic Laboratory System project (NEB 14-059). Research projects funded by the UNL Center for Biotechnology or other external sources are not required to go through the ARD Research Project review process.

▸ Faculty Research Interests ◂

✣**Barletta, Raúl G.**	Molecular genetic bases of bacterial pathogenesis and drug resistance, mycobacterial infections in cattle (Johne's disease) and human beings (tuberculosis, *M. avium* infections)
✣**Brodersen, Bruce W.**	Pathogenesis of bovine viral diarrhea virus; diagnostic pathology
✣**Cirillo, Jeffrey D.**	Molecular bases of pathogenesis of respiratory pathogens, primarily *Mycobacterium spp* and *Legionella peumophilia*
✣**Donis, Ruben O.**	Molecular biology of RNA viruses: replication and interactions with hosts; primarily bovine viral diarrhea virus and influenza virus
✣**Doster, Alan R.**	Ultrastructural changes in the lung produced by bacteria, viruses and pneumotoxic compounds
✣**Duhamel, Gerald E.**	Pathogenesis of enteric diseases caused by spirochetes and rotavirus; primarily *Brachyspira pilosicoli* and bovine rotavirus
✣**Griffin, D. Dee**	Beef cattle production medicine, especially respiratory disease in feedlot cattle
✣**Jones, Clinton J.**	Regulation of viral gene expression and persistent herpesvirus infections; mechanisms of chemical and viral carcinogenesis.
✣**Kelling, Clayton L.**	Pathogenesis of viral diseases, primarily bovine respiratory syncytial virus and bovine viral diarrhea virus infections
✣**Lou, Marjorie F.**	Biochemical mechanism of senile cataract formation: controls of cellular thiol/disulfide homeostasis
✣**Moxley, Rodney A.**	Pathogenesis and control of *Escherichia coli* infections in swine and

	cattle; on-farm control of *E. coli 0157:H7* prevalence in beef cattle (food safety)
✣**Osorio, Fernando A.**	Pathogenesis of persistent viral infections including persistent reproductive and respiratory syndrome (PRRS) virus and herpesvirus latency; vesicular diseases
✣**Rogers, Douglas G.**	Pathogenesis of chlamydial infections in livestock
✣**Rupp, Gary P.**	Effect of production practices and management on beef cattle diseases and enterprise profitability
✣**Smith, David R.**	Food safety through study of on-farm prevalence and control of *E. coli 0157:H7* in beef cattle; epidemiologic approaches to study of livestock diseases
✣**Srikumaran, Subramaniam**	Pathogen-host cell interactions, alternatives to conventional vaccines and regulation of immune responses
✣**Steffen, David J.**	Diagnosis and characterization of genetic and congenital diseases of cattle

VBMS Agricultural Research Division (ARD) Research Projects

ARD Project #	Project Title (Researchers)	Expiration Date
14-039	SAES/NEB (0096920): Research Laboratories and Animal Care Facility (J. Schmitz)	Indefinite
14-059	STATE (0153376): Vet Diagnostic Lab System: Diagnostic Surveillance & Disease Investigation in Nebraska Livestock & Poultry (J. Schmitz/A. Doster/J. Johnson/D. Grotelueschen/R. Moxley)	Indefinite
14-098	SAES/NEB (0177154): Monitoring Individual Animal Performance to Evaluate Beef Cattle Production and Economics (G. Rupp/D. Griffin)	12/31/2002
14-103	CSRS/ANIMAL HLTH/NEBR (0181124): Pathogenic Mechanisms of Bacterial Respiratory Pathogens (J. Cirillo)	10/31/2003
14-108	CSRS/NEB (0184662): Molecular Genetic Analysis of Mycobacterium Paratuberculosis and Related Mycobacterial Pathogens (R. Barletta)	09/30/2004
14-109	CSRS/Hatch (0185064): Epidemiology of Escherichia Coli O157:H7 and Salmonella in Feedlot Beef Cattle (D. Smith)	03/31/2005
14-111	CRGO/NRI/Comp Grant (0185915): A Novel Strategy to Test and Monitor Beef Feedlot Food-Safety Control Points (D. Smith)	09/30/2003
14-115	CSREES/USDA (0187737) (Hatch/NC-229): Porcine Reproductive and Respiratory Syndrome (PRRRS) (F. Osorio)	09/30/2004
14-117	CSREES/NEB (0189498) Role of A/E Proteins in E. Coli O157:H7 Intestinal Colonization of Adult Cattle (R. Moxley)	12/31/2004
14-118	CSREES/USDA Animal Health (0190103): Pathobiology of Porcine Colonic Spirochetosis Caused by Brachyspira Pilosicoli (G. Duhamel)	08/31/2006
14-119	CSREES/NEB (0190910) Functional Genomic Analysis of Bovine Vial Diarrhea (R. Donis)	12/31/2004
14-120	CSREES/NEB (0192731) Mapping of Manneheimia (Pasteurella) Haemolytica Leukotoxin Binding Site(s) on Bovine CD18 (S. Sri)	08/31/2004
14-121	CSREES/NEB (Hatch) (0192733): Evolving Pathogens, Targeted Sequences, and Strategies for Control of Bovine Respiratory Disease (S. Srikumaran)	10/09/2006
14-122	CSREES/NEB (NRI Compet. Grant) (0292971): Functional Analysis of BICPO, a Bovine Herpes Virus 1 Gene that is a Promiscuous Trans-Activator (C. Jones)	09/14/2005

VBMS Agricultural Research Division (ARD) Research Projects

ARD Project #	Project Title (Researchers)	Expiration Date
14-123	CSREES/NEB (0192972) Develop Pre-Harvest Version of the USDA-FSIS Fast Antibiotic Screening Test and Antibiotic Residue Avoidance Education (D.D. Griffin)	09/14/2005
14-124	CSREES/NEB (NRI Compet. Grant) (0193518): Role of PRRSV-Specific Antibodies in Protective Immunity Against Porcine Reproductive and Respiratory Syndrome Virus Infections (F. Osorio)	09/14/2004
14-125	CSREES/NEB (Hatch) (0005609/NC-1007): Enteric Diseases of Swine and Cattle: Prevention, Control and Food Safety	09/30/2007
14-126	CSREES/NEB (Animal Health) (0194929) Pathogenesis of Bovine Viral Diarrhea Virus and Bovine Respiratory Syncytial Virus Infections	09/30/2007
14-127	Comp Grant (SCREES/NEB/NRI Comp Grnt) (0196793) Intervention Strategies to Reduce Escherichia Coli O157:H7 in Beef Feedyards (D. Smith)	09/14/2006
14-128	CSREES/NEB) (0198063) Regulation of the Latency-Reactivation Cycle by the Bovine Herpesvirus 1 (BHV-1) Latency Related (LR) Gene (C.J. Jones/A.R. Doster)	12/14/2006

● RESEARCH PROJECTS - PROGRESS SUMMARIES ●

Biochemical Mechanism of cataract formation: Oxidative stress, thiol regulation and cataract models Investigator

Marjorie F. Lou

Our focus on the biochemical mechanism of age-related cataract formation is oxidative stress. We used hydrogen peroxide-induced cataract in organ culture condition as our model to study the progressive changes in morphology and intracellular redox potential in the lens. We demonstrated that lens opacification is associated with the increased protein insolubility and protein aggregation, resulting from lens protein oxidation by oxidative stress. We also showed that the thiol groups in lens proteins are oxidized by forming protein-thiol mixed disulfides (protein thiolation) followed by protein protein disulfide formation, a condition that will lead to lens opacification. We discovered that this deleterious process could be reversed or delayed if cataract formation is at an early stage, such as removal of the oxidant. The most drastic recovery is the reversal of the thiolation of lens proteins. Therefore, we speculate that the lens must possess some repair systems that can protect it against pathological consequences. We have found two of such repair systems, one is the glutathione-dependent thioltransferase system, which is a cytosolic enzyme and can specifically dethiolate protein-s-s-glutathione. The other is the NADPH-dependent thioredoxin system, which in conjunction with thioredoxin reductase and NADPH can reduce protein-protein disulfides. We have cloned the thioltransferase gene and the thioredoxin gene, purified the recombinant enzyme/protein for their respective functional studies. Both enzyme/protein are very resistant to oxidation and have a characteristic, conserved sequence of CXXC at their active sites. Both systems are proven to have the ability to restore the activities/functions of other oxidation-inactivated enzymes/proteins using human lens epithelial cells pretreated with hydrogen peroxide as a model. Furthermore, genes for thioltransferase and thioredoxin have been shown to upregulate under oxidative stress conditions, a phenomenon of adaptive response by the cells to combat the stress.

A secondary function of thioltransferase has been confirmed to be an ascorbate-recycling enzyme, which is able to reduce the oxidized ascorbate, dehydroascorbate, to return to the reduced form of ascorbate. This is extremely important finding, as the lens is rich in ascorbate, which along with vitamin E, contributes to the protection of membrane lipids. Ascorbate is also needed for other metabolic functions of various enzymes. The oxidized ascorbate, if not reduce in time can form glycation products with lens proteins and lead to high molecular weight aggregates. The catalytical function of thioltransferase in recycling ascorbate is first evidence that an enzyme is involved in reducing dehydroascorbate, against the dogma of a nonenzymatic recycling process.

Lastly, the mitochondrial-specific TTase (Grx2), which we co-discovered recently with Dr. Gladyshev of Biochemistry Dept, has been shown to present in the mitochondria of human lens epithelial cells. It possesses duel activities of dethiolase and dehydroascorbate reductase, similar to the cytosolic thioltransferase enzyme. We are pursuing the task of proven the physiological function of Grx2 in the mitochondria

Research Project Significance/Impacts

Based on our research results, the concept of oxidative stress-induced cellular damage as one of the major factor for cataractogenesis continue to gain momentum and has escalated our scholarly standing in the

eye field as well as outside of the lens research. One of such impact is the founding of the Redox Biology Center at UNL upon receiving the NIH award of 10 million dollar for the Cobra grant. My role of being one of the 5 senior advisors may have contributed to the success of the funding. The other impact is our discovery of the involvement of thioltransferase in the recycling of ascorbate. These results when reported at our annual national eye meeting last year, sent shocking wave to those scientists working in this area. A collaboration by the request from one of these scientists resulted in one manuscript just now completed. A third impact is my recognition and honor extended from Oxford University in England as a Leichfield Lecturer (2002-2003), and a subsequent invitation by the editor from the Oxford University to contribute a review article based on my work in this area for the series of Progress of Retina and Eye Diseases

The role of reactive oxygen species (ROS) in maintaining the health of lens cells: The redox signaling Investigator

Marjorie F. Lou

We have been concentrating in the redox signaling this year after publishing three manuscripts describing the basic signaling pathways in the lens and how diabetic condition can alter the cell signaling. We have been very successful in demonstrating that reactive oxygen species, which may be harmful to the cells/tissues, but at low level (nanomolar range) can be stimulants for various cell functions, including cell proliferation, via signal transduction pathway. It has been discovered and reported in other tissues/cells that certain growth factors such as PDGF, EGF are functional mitogens because they can stimulate ROS generation endogenously upon binding with the receptors on the cell surface. We have demonstrated with confocal microscopy that fluorescein preloaded into live human lens epithelial cells can generate fluorescence upon PDGF stimulation. The generated fluorescence can be quenched by cells preloaded with catalase enzyme or antioxidants, confirming our speculation that the lens cells have an ability to produce ROS in situ. Additionally, we have shown that exogenous hydrogen peroxide can mimic PDGF and produce similar effect, including activation of a battery of cell signaling proteins, followed by gene expression and eventual cell proliferation. We also showed that the lens cells possesses the membrane-bound enzyme NADPH oxidase, which can generate superoxide ion upon stimulation by arachidonic acid or hydrogen peroxide.

Research Project Significance/Impacts

A new physiological function of reactive oxygen species is identified as redox signaling, which is a process to mediate the function of certain growth factors for cell function. This finding has raised tremendous interest in the lens community. We have definitely being regarded as the laboratory working in the leading edge of lens research.

Research Laboratories and Animal Care Facility

J.A. Schmitz **NEB 14-039**

The Animal Research Facility (ARF) provided housing for 3,503 animals, by species as follows: cats-55, hamsters-91, pigs-368, cattle-46, chickens-328 and mice-2583. Caesarean surgery was performed on one sow, producing 13 gnotobiotic pigs used for research projects. One caesarean surgery was performed on a cow, resulting in one gnotobiotic calf. The ARF holding facility was one of 3 sites used to process deer for a statewide chronic wasting disease project.

Additional security in ARF has been implemented by installing a keyless entry into G hall and the mechanical room. Replacement of an old heat coil in G hall will allow us to control the environment more accurately and temperature indicators were installed on the refrigerators for easier monitoring. This past year, ARF has upgraded service by acquiring a new washing machine, a portable surgery light, IV fluid pumps, additional anesthesia equipment, a small animal surgery table and autoclavable micro filter top mouse cages.

IMPACT STATEMENT

ARF staff contributed to a variety of research projects on animal diseases at UNL, by supporting 17 research projects for numerous faculty members in the VBMS Department. They also have accommodated 5 research projects from other departments at UNL. ARF has also had 8 projects that were conducted for private companies; therefore, assisting in the development of new commercially-available animal health care products.

Veterinary Diagnostic Laboratory System: Diagnostic Surveillance and Disease Investigation in Nebraska Livestock and Poultry

JA Schmitz, DJ Steffen, S Ensley, BW Brodersen, DG Rogers, S Hinkley, AR Doster & FA Osorio

NEB 14-059

Diagnostic Activity: Over 1400 West Nile virus test were conducted on avian, equine and pet species. A West Nile economic impact report for USDA was produced. A joint USDA-UNL surveillance project for classical swine fever (CSF) was initiated to aid in early detection. The laboratory tested 4100 deer samples for chronic wasting disease generating data to validate an ELISA for use on white-tailed deer and began to define the distribution of the prion within Nebraska. We also performed 1800 scrapie tests. We received 16,637 request for diagnostic assistance increasing from 14,230 in 2002. Testing for BVDV increased to over 325,000 tests. Positive animals are removed from production to prevent spread of virus. Due to our leadership and reliability with this assay we were invited to serve as the IHC reference by the USDA. The Nebraska Department of Agriculture expanded Johnes disease risk analysis and herd status verification activity. The laboratory investigated an emerging agent, Brahnamella ovis, as a cause of keratoconjuctivitis in cattle. This organism is the only agent isolated from many outbreaks. The organism produces a cytoxin, hemolysisn and pilli. These are putative virulence factors were identified in our lab and characterization of these and pathogenesis studies are in progress.

IMPACT STATEMENT

The B. Ovis research may lead to vaccine development and effective controls for this emerging pathogen. Johnes and BVDV certification and testing ads value to certified and tested cattle and help limit new infections. BVDV infections rate at 1% means over 3,250 persistently infected calves, the reservoir for virus were eliminated from production systems and were unable to infect cohorts causing systemic disease, abortion and death. The BVDV work was vital to the draft AVC guidelines for BVDV eradication from the US. West Nile testing supported state-side monitoring and control programs administered by the Department of Health. Surveillance and eradication testing supports free movement of livestock products across state and national boundaries. A single case of prion disease in Canadian cattle devastated the markets for them in 2003. The control of CWD and scrapie in US wildlife and livestock may prove critical to protecting our cattle and trading partners confidence in our food products.

Monitoring Individual Animal Performance to Evaluate Beef Cattle Production and Economics

G. P. Rupp and D. D. Griffin NEB 14-098

This project is designed to evaluate the overall production and performance of beef cow herds from breeding through carcass including reproductive performance and health of calves. Individual animal records were maintained within herds and calves were followed from their herd of origin through feeding and processing. Samples for evaluating passive transfer and paternity were collected and calves sent to slaughter were evaluated for lung lesions. Additional production and financial information were collected to support production information. Laboratory analysis of DNA from blood samples have been utilized for immunoglobulin status for calves and paternity evaluation for multi-sire breeding groups. Data is still being analyzed for future publications.

IMPACT STATEMENT

Information from this project has resulted in one paper published and one major paper submitted. Additional papers are still anticipated and the project has served two graduate student programs. Some of the difficulties and benefits of utilizing paternity identification have been elucidated.

Pathogenic Mechanisms of Bacterial Respiratory Pathogens

J. Cirillo NEB 14-103

Respiratory pathogens are the number one cause of death in both domesticated animals and humans throughout the world. Respiratory problems, including bacterial infections, are the number one cause of mortality in cattle and calves leading to greater than 478 million dollars in economic loss in the U.S. Respiratory problems are also the number one cause of nursery deaths in swine. We have begun investigation of the causes of bacterial respiratory pathogens and the common molecular bases for pathogenesis. At present, we have identified more than 55 genes that are involved in virulence of respiratory pathogens and are in the process of constructing mutations in them. Careful characterization of the effects of different mutations on virulence has led to a better understanding of the mechanisms involved. Characterization of multiple strains of Legionella has demonstrated that there is a great deal of variability in the genomic organization and virulence of the strains used for laboratory studies. These studies suggest that examination of the role of virulence genes in Legionella must take into account the strain used, requiring reexamination of many previous studies in the field. We have also identified more than 22 genes involved in the mechanism of entry by mycobacteria into macrophages that appear to be present in all virulent mycobacterial species and is likely to be a key component of pathogenesis in M. bovis and M. paratuberculosis. We have completed sequence and complementation analysis of more than 12 of these genes. Further studies are necessary to determine the host receptors and we have made significant progress toward understanding the signal transduction pathways involved. In addition, we have developed a novel model system for the study of the virulence mechanisms of fish pathogens. These studies are likely to have a significant impact on our understanding of respiratory pathogens as well as important pathogens in aquaculture. Thus, we have made significant progress in our characterization of virulence determinants in respiratory pathogens and have been able to demonstrate that the determinants we have isolated play an important role in pathogenesis.

IMPACT STATEMENT

Respiratory Infections in the cattle and swine industry lead to greater than 478 million dollars in economic loss in the U.S. Our laboratory has developed methods that are likely to be useful in the prevention and treatment of these infections. In addition, we have made significant progress in our characterization of virulence determinants in respiratory pathogens and have been able to demonstrate that these factors play an important role in respiratory diseases in animals.

Molecular genetic analysis of mycobacterium paratuberculosis and related mycobacterial pathogens

R. Barletta NEB 14-108

Mycobacterium avium subsp. paratuberculosis (M. paratuberculosis), the etiologic agent of paratuberculosis (Johne's disease) in ruminants. The objectives of this project are to develop a selection strategy to identify M. paratuberculosis transposon mutants with reduced replication in bovine macrophages, to characterize attenuated mutants, to identify and characterize immunogenic M. paratuberculosis secreted and cellular proteins, and to identify drugs effective against M. paratuberculosis. During this period, our research focused on the molecular genetic basis of intracellular survival in macrophages. Using transposon Tn5367, we created a bank of 13,536 random mutants. This mutant bank was screened for resistance and susceptibility to antimicrobial agents, colony morphotypes, survival in bovine macrophages, and for specific mutants by PCR. This screen yielded sixty-three additional mutants that were hypersusceptible to D-cycloserine, seven colony morphology mutants, and one siderophore mutant. We also developed a positive selection strategy to enrich for auxotrophic mutants in vitro. Using the fluoroquinolone Bay y 3118 to kill prototrophic bacilli growing in minimal medium, we identified one hundred and seven putative amino acid auxotrophs. The mutant bank was also subjected to PCR screening for mutants of interest, resulting in the identification of a transposon insertion mutant that was mapped 30 nucleotides downstream from the sodA gene. A subset of these mutants displayed an attenuated phenotype. In summary, a system for transposon mutagenesis and a strategy for tracking live and dead M. paratuberculosis cells within macrophages were developed. Further screening and characterization of selected transposon mutants will likely identify specific genetic loci involved in pathogenesis, suggesting novel strategies for the control of Johne's disease. In addition, in collaborative studies, the characterization of B-cell epitopes of the immunodominant protein P34 was completed.

IMPACT STATEMENT

Paratuberculosis causes an estimated one billion dollars in annual losses to the U. S. dairy industry alone. The functional analysis of M. paratuberculosis mutants may aid in the development of a vaccine to control Johne's disease.

Epidemiology of *Escherichia coli* O157:H7 and salmonella in feedlot beef cattle

D. Smith NEB 14-109

Three clinical trials testing methods to reduce the prevalence of E. coli O157:H7 among feedlot cattle have recently been completed. Each was conducted during the summer under conditions typical of Midwestern feedyards and natural O157:H7 exposure. Sampling was conducted longitudinally throughout the

finish-feeding period. In each study the prevalence of O157:H7 shedding differed significantly by time (and treatment) and was typical of the range of prevalence we have previously observed in both commercial and research feedyards. In each case there was no significant interaction between time period and treatment. The method of statistical analysis accounted for pen-level treatments and repeated measures.

1) In 2002 we fed Lactobacillus spp. (DFM) to 96 steers in 12 research pens; another 12 pens (96 steers) were untreated. We collected and cultured feces from the rectum of each steer every 3 weeks throughout the feeding period; one pre-treatment and 5 test periods. In 2003, we fed DFM to 128 steers in 12 research pens (8 pens of 8 steers and 4 pens of 16); another 12 pens (128 steers) were untreated. We collected and cultured feces from the rectum of each steer every 3 weeks for one pre-treatment and 6 test periods. Prevalence varied significantly between 2002 and 2003. In 2002 the probability for a DFM-treated steer to shed O157:H7 over the test periods was 13% compared to 21% among untreated cattle. In 2003 the average probability of shedding was 21% among DFM-treated steers compared to 28% for controls. Over the two years DFM treated cattle were 35% less likely to shed O157 than cattle in untreated pens (DFM efficacy = 35%, p=0.002).

2) Vaccine prepared using antigens of the secretory proteins of EHEC cellular attachment (B Finley, UBC) was administered to 12 pens of 8 cattle, another 12 pens received only adjuvant (N=192). Cattle received 3 doses of vaccine 3 weeks apart SC in the neck. We collected and cultured feces from the rectum of each steer every 3 weeks throughout the feeding period; one pre-treatment and 5 test periods. Vaccinated cattle were 59% less likely to shed O157:H7 than controls (vaccine efficacy=59%, p=0.04). Also, vaccinated cattle demonstrated a significant increase in antibodies directed against EHEC secretory proteins.

3) Zero, 1, 2, or 3 doses of vaccine prepared by Bioniche Life Sciences, Inc (identical antigen profile to Finlay prototype vaccine) was given to 120 steers each within 60 pens of 8 cattle each. 128 cattle in 12 external control pens received no vaccine. We collected and cultured feces from the rectum pre-treatment and 21, 42, 63, and 84 days post-treatment. Over the post-treatment period cattle receiving vaccine were 59% less likely to shed O157:H7 compared to external control cattle (p=0.0008).

IMPACT STATEMENT

We observed consistent and significant efficacy of the vaccines and DFM, providing solid evidence that these methods are credible for control of O157:H7 in live cattle thereby reducing human exposure to this pathogen through food or the environment.

A Novel Strategy to Test and Monitor Beef Feedlot Food-Safety Control Points

D. Smith/L. Hungerford NEB 14-111

This is the 3rd year of a 3-year project to validate and use a novel approach to classifying pens of feedlot cattle by food safety pathogen status. The study design includes observational studies during both the summer and winter months. Longitudinal studies and cross-sectional studies are complete. A one-year extension is being used to complete analysis of the data and manuscripts are in preparation.

Longitudinal studies were conducted to describe the ecology of *Escherichia coli* O157:H7 in pens of commercial feedlot cattle by feedyard, season (winter, summer) and year. Pens of cattle were monitored each

week from arrival to marketing using bacterial culture of seven devices prepared from rope available overnight for cattle to rub or chew. Recovery of the agent from at least one rope classified the pen as positive. Test of homogeneity or independence of proportions was tested by chi-square analysis at alpha <0.05. The runs test was used to detect clustering (underdispersion) of the agent within pens over time. In the summer of 2000, 31 pens were each monitored for a mean 20 weeks (15-26). In the summer of 2001, 24 pens were each monitored for a mean 18 weeks (11-25). In the winter of 2001, 10 pens were each monitored for a mean 18 weeks (13-22). In the winter of 2002, 10 pens were each monitored for a mean 14 weeks (9-19). *E. coli* O157:H7 was recovered at least once from every pen (100%) during both summers. The rate of recovery was not different between summers (274/627 pen-weeks (44%) and 177/425 pen-weeks (42%), respectively). *E. coli* O157:H7 was recovered at least once from 9/10 pens (90%) during winter, 2001 and from all pens (100%) during winter of 2002. The rate of recovery differed between the two winters (22/207 pen-weeks (11%) and 32/141 pen-weeks (23%) respectively). The rate of recovery of either winter study was less than that of the two summer studies. Recovery of the agent within pens clustered over time and the proportion of positive testing pens varied significantly with time even though the 5 feedyards were separated by 50-200 km. The rope devices were useful for studying the ecology of *E.coli* O157:H7 over time and place in the beef feedyard.

IMPACT STATEMENT

Understanding when and where food safety pathogens occur in cattle feedlots enable us to speculate on ways to control those agents. We also need this information so that we can design clinical trials to test interventions.

Porcine Reproductive and Respiratory Syndrome (PRRRS)

F.O. Osorio

NEB 14-115

One sub-project was conducted as part of Objective 3 of the NC-229 project:

1) Role of Antibodies in protective Immunity agaisnt PRRSV Lopez & Osorio (UNL), Platt (ISU), Nelson (SDSU)

During the last year the area of concentration in this project has been primarily that of neutralizing epitope mapping and construction of chimeric mouse X swine neutralizing antibodies. We focused on the effect that virus bound to chimeric antibodies had on macrophage infection, mapping of neutralizing epitopes in different proteins of PRRSV, and inducing neutralizing antibodies in non-replicating immunogens in swine and mice. The results from these projects will provide important information that will be used to produce vaccines and hibridomas producing monoclonal antibodies with neutralizing activity against PRRSV. We are also working on the development of a test to determine the present of neutralizing antibodies in vaccinated pigs in an ELISA format. The data and reagents derived from this research will be made available to all NC-229 participants.

Another Sub-project was conducted as part of Objective 4 of the NC-229 project:

2) Use of Blocking ELISAs to Detect Antibodies anti_PRRSV in Non-Swine Species Osorio (UNL), Zimmermann (ISU), Nelson and Ferrin (SDSU).

The overall objective of these experiments was to test the ability of existing immunoassays to detect

antibodies to PRRSV in non-swine species. We first proved that commercial and experimental blocking ELISAs detect antibodies when these are actively induced in non-swine species. This result suggests that it would be possible to use immunoassays for detecting putative naturally-occurring PRRSV antibodies in non-swine species for diagnostic purposes. This has sgreat significance in the search for PRRSV natural reservoirs. Surprisingly, though, it was not possible in these experiments to experimentally infect Mallard ducks, reportedly the only non-swine-species capable of replicating PRRSV. This infection was not possible either by replicating the exact conditions that had been successful in a single previous lab, or by using different routes and different strains of PRRS. Based on these results, we can conclude that the experimental inoculation of Mallard ducks with PRRSV is not a consistent occurrence. This perhaps reflects a need for additional experimental conditions that are so far unrecognized. Further work is necessary to clarify the role of Mallard ducks as reservoirs of PRRSV in nature. More conclusive evidence about the role of Mallard ducks and any other birds in PRRSV transmission could be obtained through the use of serology kits in serum samples collected from wild ducks and birds.

IMPACT STATEMENT

The truly inter-institutional collaborative character of this regional research is documented by three articles accepted by to refereed journals which involve five different experimental stations that participate of NC-229: Nebraska, Mississippi, Iowa, South Dakota and Illinois. Part of this regional research is being supplemented by a private company interested in possible commercial applications ("Production of Mouse x Porcine Neutralizing Antibodies anti-Porcine Reproductive and Respiratory Syndrome Virus," $44,955, PIC USA (Sygen International) February 2002/February 2004).

The most significant inter-institutional activity derived from this program has been our participation with the University of Minnesota (PI institution) and 12 other stations in an integrated National Research Initiative Competitive Grant for $4 million. The title of this inter-institutional grant proposal, entirely based on the NC-229 project is: "Integrated Control and Elimination of Porcine Reproductive and Respiratory Syndrome Virus (PRRSV) in the US." The PI of this grant is Michael Murtaugh (U. of Minnesota), the funds requested are $4,000,000 and the proposed period of work is January 1, 2004 to December 31, 2007 (48 months). The grant involves 13 land grant universities and 4 resreach centers, plus etxernal industry collaborators.

Role of AE Proteins in *E. Coli* O157:H7 Intestinal Colonization of Adult Cattle

R. A. Moxley NEB 14-117

A clinical trial was conducted to test the effects of vaccination and a direct-fed microbial (DFM) product on the proportion of feedlot steers shedding *Escherichia coli* O157:H7 in their feces. Three hundred eighty-four steers in 48 pens were assigned randomly to DFM and vaccine treatments in a 2 x 2 factorial design with three weight blocks and twelve repetitions per treatment. The vaccine, containing secreted proteins of *E. coli* O157:H7, was administered three times at 3-week intervals to cattle within assigned pens beginning d-0 of each block. A Lactobacillus acidophilus DFM product was fed with the ration continuously from d-24 of the trial. Samples of rectal feces were obtained from each block every three weeks for the entire 121-d (May-September) feeding period, resulting in one pre-treatment and five test-period samplings. The average proportion of cattle shedding *E. coli* O157:H7 for treatments of control, DFM alone, vaccine alone, and DFM with vaccine were 21.3%, 13.3%, 8.8% and 7.7%, respectively. Adjusting for the effect of DFM

and block, the proportion of vaccinated cattle shedding *E. coli* O157:H7 was significantly less than that of non-vaccinated cattle (P=0.03). Brachyspira pilosicoli is the cause of an inflammatory bowel disease that affects a wide range of animal species, including human beings. We have investigated a laboratory mouse model for studies aimed at understanding *B. pilosicoli*-host interaction. Comparative bacteriological, histopathological and immunological analyses of C3H/HeN and C3H/HeOuJ fed a define diet and challenged by the orogastric route with *B. pilosicoli* strains obtained from either human, porcine or avian hosts revealed that although both strains of mice are colonized by all three strains of spirochetes, the rate of infection, the duration of cecal colonization, and the kinetics and the titer of serum antibodies are different for each spirochete across mouse strains.

IMPACT STATEMENT

Two effective intervention strategies for reduction of the prevalence of *E. coli* O157:H7 in feedlot cattle were identified in a clinical trial. These two strategies, vaccination and a direct-fed microbial, may be used alone or in combination, and are directly usable in feedlots. A better understanding of basic mechanisms involved in *B. pilosicoli*-host interaction will lead to the development of improved strategies for control of the disease in humans and animals.

Pathobiology of Porcine Colonic Spirochetosis Caused by Brachyspira Pilosicoli

G. E. Duhamel **NEB 14-118**

Brachyspira pilosicoli is the cause of colonic spirochetosis, an inflammatory bowel disease that affects a broad range of hosts including human beings. The disease is important to the swine industry because of the economic impact on the performance of grower and finisher pigs. Because membrane proteins of *Brachyspira* are likely to play a key role in mediating spirochete host cell interactions, we compared the membrane protein profiles of reference porcine *Brachyspira* species obtained by phase partitioning with the nonionic detergent Triton X-114 into aqueous (TXA) and detergent (TXD) phases and gel electrophoresis. Immunoblot analysis of each phase with marker-specific antibodies revealed that the TXD phase was enriched for outer membrane proteins, whereas the TXA phase contained periplasmic proteins. We found that between species TXA and TXD profiles were highly variable, whereas intraspecies profiles were more conserved for each detergent phase. Correlation between the presence of specific membrane proteins and the clinicopathological attributes of pathogenic *Brachyspira* species might provide a basis for understanding the pathogenesis of porcine spirochetal colitis. In related studies, we determine whether or not a group of inner membrane proteins involved in the final stage of peptidoglycan biosynthesis and specifically inhibited by B-lactam antibiotics, the penicillin-binding proteins (PBPs) are present in *B. pilosicoli*. Using ampicillin conjugated to digoxigenin and immunoblot chemiluminescent assay, we found that homologues of *Escherichia coli* PBPs 1, 3 and 5/6 were present in *B. pilosicoli*. Because of the variable combinations of indigenous and pathogenic *Brachyspira* species potentially present in intestinal specimens from different host, a definitive diagnosis of spirochetal colitis can be very challenging. A previously described NADH oxidase gene (nox) PCR-based restriction fragment length polymorphism method was further developed for identification of human and animal *Brachyspira* species. The new assay provided a relatively simple method for rapid and specific identification of pathogenic and commensal *Brachyspira* present in a wide range of hosts.

IMPACT STATEMENT

A better understanding of the molecular basis of intestinal epithelial cell attachment of *B. pilosicoli* and resistance to antibiotics will lead to the development of improved strategies for control of spirochetal colitis

in humans and animals.

Functional Genomic Analysis of Bovine Vial Diarrhea

R. Donis NEB 14-119

In order to identify and characterize BVDV mutants that display altered pathogenetic properties we have developed a library of signature-tagged (ST) mutants of BVDV. Tagged transposons have been inserted into the noncytopathic NADL strain infectious clone to generate ST plasmids, followed by recovery of a mutant ST-BVDV library. We are currently characterizing the resulting library before we can initiate animal studies.

In animal studies, we have identified mutants of BVDV which fail to cause viremia. Preliminary studies suggest that the altered viral tropism is consequence of inactivation of elements involved in efficient IRES function. Further in vitro studies are being conducted to test this hypothesis (manuscript in preparation).

To further explore the role of viral tropism in viremia, we have also exploited a homolog scanning approach, by chimerism with the closely related ovine pestivirus (border disease virus). Our preliminary studies showed that BVDV isolates infect cultured Madin-Darby bovine kidney (MDBK) cells as efficiently as sheep kidney cells. In contrast, border disease virus (BDV) propagates poorly in MDBK cells but infects sheep cells very efficiently. Because the envelope glycoprotein E2 has been shown to be essential for virus infectivity, we explorede its potential role in pestivirus host range in cell cultures by engineering a chimeric BVDV with the E2 coding region from BDV. As expected, the BVDV-E2(bdv) chimera retained the ability of BDV to multiply in sheep cells, but experienced a remarkable reduction in its ability to propagate and form plaques in MDBK, a phenotype that is characteristic of the E2 donor, BDV31 virus. Control chimeric BVDV bearing a type II E2 demonstrated that the heterologous E2 does not impair replication in MDBK or lamb cells. These results establish a role for E2 in determining the tropism of a pestivirus in cell culture (Liang et al. 2003).

In previous studies we showed the importance of the biotype of BVDV (cytopathic or noncytopathic) with regards to viremia and fetal infection. To understand the cellular responses to cp BVDV infection, we carried out differential display-polymerase chain reaction (DD-PCR) analysis of gene expression in infected cells. Altered expression of 14 genes involved in several functions was observed in cells infected with cp BVDV: 1) immune regulation, such as CD46, FKBP-12, and osteopontin (OPN); 2) apoptosis-related cysteine proteases like calpain; 3) signaling plasma membrane proteins such as integrin beta-1 and prion protein; and 4) unknown function genes. Northern blot analysis of the expression of these genes in ncp BVDV infected cells revealed that while the expression of some genes was affected as in cp BVDV infected cells, others show a clearly contrary change. We postulate that a cause-effect relationship may exist between the differential gene expression alterations that characterize cp and ncp BVDV infections and the unique viral tropism associated with each BVDV biotype (Risatti et al. 2003).

IMPACT STATEMENT

Understanding the molecular basis of virulence and vertical transmission of BVDV will result in improved disease control implementing by changes in management, therapy and vaccination. The knowledgy generated in this research shows a correlation between the failure of CP BVDV to cause viremia and low transmissibility of this strain to the fetus. In the short term, this correlation will facilitate research aimed at identifying vaccine candidates that are safe for the fetus; viremia may be used as a predictor of the transplacental transmissibility of BVDV.

Mapping of Mannheimia (Pasteurella) Haemolytica Leukotoxin Binding Site(s) onBovine CD18

S. Srikumaran NEB 14-120

The leukotoxin secreted by Mannheimia (Pasteurella) haemolytica is a major virulence factor of this organism. Previously, we and others identified beta 2-integrins as the receptor for the leukotoxin. Subsequent studies in our laboratory indicate that the beta subunit of the integrins, CD18 is necessary and sufficient to induce the leukotoxin-mediated cytolysis. Hence the next logical step would be to identify the toxin binding site(s) on CD18. This project commenced in September, 2002. The bovine and murine CD18 molecules have 80% amino acid sequence homology which permitted the construction of chimeric CD18 molecules with minimum disruption of conformation. The bovine and mouse CD18 aa sequences were aligned to identify regions of variation. The N-terminal and C-terminal regions were found to have the most variation. The nucleotide sequences of bovine CD18 and mouse CD18 were then compared, and three unique single restriction sites present in both the sequences at identical nucleotide positions were identified which enabled us to divide CD18 into four regions. We constructed chimeric bovine- murine CD18 molecules by replacing one of the four regions of bovine CD18 with the corresponding region of murine CD18 and vice versa. These bovine-murine chimeric CD18 cDNA were transfected into P815 cells. Stable transfectants expressing the chimeric CD18 on the cell surface as a heterodimer with murine CD11a were selected, and subjected to cytotoxicity assays with the leukotoxin. Results obtained so far indicate that the leukotoxin-binding domain mat lie in the region encompassed by amino acids 1-291. Further analysis of the region continues.

IMPACT STATEMENT

Identification of the binding sites on CD18 would pave the way for development of means of abrogation of leukotoxin binding to bovine leukocytes.

Evolving Pathogens, Targeted Sequences and Strategies for Control of Bovine Respiratory Disease

S. Srikumaran NEB 14-121

Previous studies in our laboratory indicated that beta subunit of the integrins, CD18 is necessary and sufficient to induce leukotoxin-mediated cytolysis. Hence the next logical step would be to identify toxin binding site(s) on CD18. Bovine and mouse CD18 aa sequences were aligned to identify regions of variation. N- and C-terminal regions were found to have the most variation. Nucleotide sequences of bovine CD18 and mouse CD18 were then compared, and 3 unique single restriction sites present in both sequences at identical nucleotide positions were identified which enabled us to divide CD18 into 4 regions. We constructed chimeric bovine-murine CD18 molecules by replacing one of the 4 regions of bovine CD18 with the corresponding region of murine CD18, and vice versa. These chimeric CD18 cDNA were transfected into P815 cells. Stable transfectants expressing chimeric CD18 on the cell surface were selected, and subjected to cytotoxicity assays with leukotoxin. Results obtained so far indicate that leukotoxin-binding domain lies between amino acids 1-291.

Previously, we showed that bovine herpesvirus 1 (BHV-1) down-regulates the expression of MHC class I

molecules by interfering with transport of peptides by transporter associated with antigen processing (TAP). Further studies revealed that BHV-1 down-regulates the expression of mRNA for class I molecules and other cellular proteins. To further elucidate mechanism(s) of down-regulation of class I molecules, previously we constructed a virion host shut off (vhs) deletion mutant, and demonstrated that down-regulation of class I molecules by BHV-1 is mediated by non-specific vhs activity of the virus, as well as mechanism(s) specifically directed at the class I pathway. Currently, we are employing transposon mutagenesis as a means of identifying the BHV-1 protein that mediates the down-regulation of class I molecules. In another facet of this project we explored the potential of epitope-based vaccines against BHV-1. We determined the feasibility of inducing CTL response against BHV-1, by co-immunization with plasmids encoding BHV-1 gD (pELVSgD) and bovine gp96 (pS-Btgp96). One group of mice was injected intramuscularly with equal quantities of pELVSgD and pS-Btgp96. Second and third groups were injected with pELVSgD and pS-Btgp96, respectively. Group of mice co-immunized with pELVSgD and pS-Btgp96 developed a strong CTL response against BHV-1. Control group immunized with pS-Btgp96 did not develop anti-BHV-1 CTLs. However, the CTL response of mice co-immunized with pELVSgD and pS-Btgp96 was not significantly higher than that of mice immunized with pELVSgD alone. Co-immunization may not always result in the entry of both plasmids into the same cells. In order to rule out this scenario, we developed a single plasmid encoding both the cytosolic version of BHV-1 gD and S-Btgp96. Preliminary results indicate that mice immunized with this plasmid developed a better BHV-1-specific CTL response than those immunized with the plasmid encoding BHV-1 gD alone.

IMPACT STATEMENT

Identification of the receptor for the Lkt should facilitate development of means of interruption of the binding of the Lkt to leukocytes, and hence prevention of disease caused by M. haemolytica. Development of strategies to induce CTL response against BHV-1 should lead to the development of more efficacious vaccines against this economically important pathogen.

Functional Analysis of BICP0, a Bovine Herpes Virus 1 Gene that is a Promiscuous Trans-Activator

C. J. Jones **NEB 14-122**

Bovine herpes virus 1 (BHV-1) can cause clinical symptoms in cattle and induce "shipping fever," which costs the industry more than $640 million per year. Current vaccines can be pathogenic to small calves, cause abortions, and do not prevent latency of wild-type virus. BHV-1 establishes latency but can reactivate, in part, because the bICP0 protein activates viral gene expression. bICP0 can activate expression of all three classes of viral genes, is expressed throughout productive infection, and is thus considered to be the most important viral regulatory gene. We have demonstrated that a C3HC4 zinc ring finger near the amino terminus of bICP0 plays an important role in activating transcription and productive infection. Furthermore, bICP0 interacts with two cellular transcription factors [histone deacytlase 1 (HDAC1) and a histone acetylase (p300)].

We have recently developed a mutant BHV-1 strain that contains mutations within the C3HC4 zinc ring finger. This mutant grows poorly and does not form well-defined plaques. We are in the process of characterizing this mutants growth properties. Other studies have demonstrated that bICP0 induces caspase 3, which is one reason why the gene is cytotoxic. Interestingly, we have also demonstrated that deletion of sequences in bICP0 that play a role in stimulating transcription enhances the cytopathic properties of bICP0. Our studies have also suggested that bICP0 inhibits p53 dependent transcription. Since p53 is an important

part of the hosts interferon response, we predict that bICP0 will play a role in defeating the hosts innate immune response, thus allowing BHV-1 to grow in cattle.

IMPACT STATEMENT

BHV-1 is an important pathogen of cattle, which costs the cattle industry $1/2 billion/year in the US. These studies will help us understand bICP0 function and its relationship to disease and may help the vaccine industry design modified live vaccines that induce immunity, do not cause disease in cattle, and do not reactivate from latency.

Develop Pre-Harvest Version of the USDA-FSIS Fast Antibiotic Screening Test and Antibiotic Residue Avoidance Education

D. D. Griffin **NEB 14-123**

The first objective, to develop a live animal test equivalent to FAST by determining the minimum inhibitory concentration (MIC) of commonly used antimicrobials on Bacillus megaterium has been accomplished. Validation of the results is underway. Testing of antibiotic spiked urine will be completed within the next 60 days. In vivo testing has been scheduled for cattle that can be traced from birth to the farm of origin. This insures a complete analysis of health treatment records. Cattle with a history of antibiotic treatment will be excluded. Cattle born in the spring of 2003 have been identified and are presently be followed through their weaning health events. These cattle will be available for in vivo testing during the summer of 2004. Minimum inhibitory concentrations (MIC) for 14 different antibiotics commonly used in the field, using the ATCC reference strain 9885 of B. megaterium will be determined and compared to the in vitro results. The following antimicrobial groups will be represented: aminocyclitols (spectinomycin), aminoglycosides (gentamicin, neomycin), beta-lactams (penicillin G, ampicillin, ceftiofur), chloramphenicol derivatives (florfenicol), fluoroquinolones (enrofloxacin), lincosamides (lincomycin), macrolides (tilmicosin, tylosin,), sulfonamides (sulfadimethoxine, sulfamethazine) and tetracyclines (oxytetracycline). Even thought the price of cattle across the United States is setting records never seen in the beef industry before, we do not anticipate the supplier of the cattle for this project to withdraw from the project.

The preliminary outline for the field instruction manual for use of the Pre-Harvest Antibiotic Screening Test has been developed and is being evaluated by 20 practicing beef feedlot veterinarians. These veterinarians are located in six states (Colorado, Iowa, Kansas, Nebraska, Oklahoma and Texas).

A seminar with the USDA-FSIS has been scheduled to discuss the interim findings of this project. Adjustments will be made as need to meet the national residue avoidance program.

IMPACT STATEMENT

Presently there is not a pre-harvest antibiotic residue screening test available to mirror the new antibiotic screening test adopted by the USDA-FSIS 2000. This increases the risk of producers marketing an animal with violative residue, risks consumer confidence in the nation's food supply and potentially impacts the economic sustainability and profitability of the United States beef industry. A pre-harvest antibiotic screening test that mirrors the USDA-FSIS FAST test will be developed. Disseminate the information to producers and veterinarians.

Role of PRRSV-Specific Antibodies in Protective Immunity Against Porcine Reproductive and Respiratory Syndrome Virus Infections

F. A. Osorio NEB 14-124

Since 1996 and through different NRICGP funding cycles, our research has centered on PRRSV pathogenesis and the host response to this virus. Our most current research focuses on the biological significance of the humoral immune response in the protection against PRRSV infections. We present here unequivocal evidence that the PRRSV humoral immune response fulfills a principal role in the in vivo protection against PRRSV infection, a concept that contradicts the commonly accepted notions on PRRSV protective immunity held to date. We believe that such protection is mediated mostly by the PRRSV-neutralizing antibodies (although perhaps non-neutralizing antibodies may also play a role). The central hypothesis of this proposal states that antibodies generated by a pig during an infection with PRRSV confer significant protection against infection. For reasons still unknown, these protective antibodies are absent during the early phase of the infection. We now propose to further these studies through the pursuit of the following objective: To map the protective epitopes (either neutralizing or non-neutralizing) in the relevant antigens of PRRSV. To that end, we will select mimotopes from a phage display library of peptides and a PRRSV peptide phage library by screening with highly protective hyperimmune serum The results of this research should have significant bearing on the design and quality control of new, better vaccines against PRRSV as well as on the control and clearance of PRRSV-infected herds.

PROGRESS MADE DURING 2003

Neutralizing antibodies protect against PRRSV's infection in pigs. The main target for these neutralizing antibodies in PRRSV is protein GP5. We had mapped a neutralizing epitope in PRRSV's GP5 that we named epitope B. ISU25-C1 is a monoclonal antibody which recognizes this area of GP5 of PRRSV-Kentucky isolate. We cloned the DNA encoding the variable heavy and variable light chain of this monoclonal antibody in frame with the DNA encoding the constant regions of porcine antibodies. Two different chimeric (mouse x porcine) antibodies anti-PRRSV GP5 were secreted from a baculovirus-based expression system. The antibody-binding site corresponds to mouse antibody ISU25-C1. The constant regions correspond to porcine lambda for the light chain and porcine gamma-1 or gamma-2 for the heavy chain. Both chimeric antibodies (ISU25-C1-gamma 1 and ISU25-C1-gamma 2) bind to PRRSV GP5 in ELISA and Western blot. The production of these antibodies will allow us to study the role of porcine antibody constant regions in complement-mediated neutralization and macrophage activation through its Fc-receptors.

Enteric Diseases of Swine and Cattle: Prevention, Control and Food Safety

R. A. Moxley, G. E. Duhamel and D. R. Smith NEB 14-125

A clinical trial was conducted to test the effects of vaccination and a direct-fed microbial (DFM) product on the proportion of feedlot steers shedding *Escherichia coli O157:H7* in their feces. Three hundred eighty-four steers in 48 pens were assigned randomly to DFM and vaccine treatments in a 2 x 2 factorial design with three weight blocks and twelve repetitions per treatment. The vaccine, containing secreted proteins of *E. coli O157:H7*, was administered three times at 3-week intervals to cattle within assigned pens beginning d-0 of each block. A Lactobacillus acidophilus DFM product was fed with the ration continuously from d-24 of the trial. Samples of rectal feces were obtained from each block every three weeks for the entire

121-d (May-September) feeding period, resulting in one pre-treatment and five test-period samplings. The average proportion of cattle shedding *E. coli O157:H7* for treatments of control, DFM alone, vaccine alone, and DFM with vaccine were 21.3%, 13.3%, 8.8% and 7.7%, respectively. Adjusting for the effect of DFM and block, the proportion of vaccinated cattle shedding *E. coli O157:H7* was significantly less than that of non-vaccinated cattle (P=0.03). *Brachyspira pilosicoli* is the cause of an inflammatory bowel disease that affects a wide range of animal species, including human beings. We have investigated a laboratory mouse model for studies aimed at understanding *B. pilosicoli*-host interaction. Comparative bacteriological, histopathological and immunological analyses of C3H/HeN and C3H/HeOuJ fed a define diet and challenged by the orogastric route with *B. pilosicoli* strains obtained from either human, porcine or avian hosts revealed that although both strains of mice are colonized by all three strains of spirochetes, the rate of infection, the duration of cecal colonization, and the kinetics and the titer of serum antibodies are different for each spirochete across mouse strains.

IMPACT STATEMENT

Two effective intervention strategies for reduction of the prevalence of *E. coli O157:H7* in feedlot cattle were identified in a clinical trial. These two strategies, vaccination and a direct-fed microbial, may be used alone or in combination, and are directly usable in feedlots. A better understanding of basic mechanisms involved in *B. pilosicoli*-host interaction will lead to the development of improved strategies for control of the disease in humans and animals.

Pathogenesis of Bovine Viral Diarrhea Virus and Bovine Respiratory Syncytial Virus Infections

C. L. Kelling **NEB 14-128**

Bovine respiratory disease complex (BRDC) has a major negative impact on profitability in the beef cattle industry. BRDC outbreaks are caused by interactions of multiple ubiquitous pathogens, such as bovine viral diarrhea virus (BVDV) and bovine respiratory syncytial virus (BRSV), in affected animals. The long-term goal of this project is to characterize pathogenesis of BVDV and BRSV infections.

BRSV plays a direct role in causing BRDC by causing lower respiratory tract disease (broncho-pneumonia) in calves. Several BRSV vaccines are commercially available; however, protection is incomplete following vaccination or natural infection, as re-infections are common. The attachment (G) glycoprotein of BRSV is a major protective antigen, capable of inducing virus-neutralizing antibodies. Two forms of BRSV G are synthesized, a full-length, type II integral membrane protein and a truncated form, which undergoes proteolytic cleavage and is secreted. The BRSV G ectodomain, is heavily glycosylated with O-linked sugars, which may protect the viral peptide from being recognized as a foreign antigen. Within the mucin-like ectodomain of BRSV G exists a central, fully-conserved region spanning amino acids 166-186 that may be play a role in receptor binding. Plasmid DNA constructs encoding the full-length, secreted, or conserved region of the BRSV G glycoprotein, were used to induce significant and equivalent anti-BRSV G IgG responses in BALB/c mice.

BVDV plays an indirect role in causing BRDC, by causing immunosuppression during co-infections, which causes enhancement of disease. BVDV isolates have variable virulence. BVDV has a 12.5 kb, single-stranded RNA genome consisting of a 5' untranslated region (UTR), a single large open reading frame and a 3' UTR. The 5' UTR contains an internal ribosomal entry site (IRES) necessary for translation in a cap-independent manner. Functional analyses of the role of the BVDV 5'UTR IRES elements of BVDV2 isolates

were conducted to determine the biological significance of nucleotide changes that correlate with virulence. Point mutations created within the 5 UTR IRES caused decreased translational efficiencies of five of eight isolates studied. Translational efficiencies of two isolates were not significantly affected, while translational efficiencies of one isolate were increased following point mutations compared to the parent plasmids. These results reaffirm the genetic diversity among BVDV isolates.

Quantitative competitive RT-PCR (QC-RT-PCR) and single tube, fluorogenic probe-based, real-time quantitative reverse transcription-polymerase chain reaction (Q-RT-PCR) assays were developed for detection and quantification of BVDV and BRSV. Real-time Q-RT-PCR was compared with QC-RT-PCR and viral titers. It was possible to detect as few as 124 copies of standard BVDV cRNA/ul and 171 copies of standard BRSV cRNA/ul with real-time Q-RT-PCR. The results of real-time Q-RT-PCR correlated with QC-RT-PCR.

IMPACT STATEMENT

The BRDC causes a significant negative impact on animal well-being and profitability in the U.S. cattle industry. BVDV and BRSV infections are important causes of BRDC and vaccines are available to help control those infections; however, the vaccines do not provide complete protection. Our research contributed to development of new diagnostic approaches and to the understanding of mechanisms involved in BRSV and BVDV infections. This diagnostic capability and understanding are useful for developing effective intervention strategies to help control BRDC to enhance animal well-being and increase profitability.

Intervention Strategies to Reduce Escherichia Coli O157:H7 in Beef Feedyards

D. Smith, G. Erickson, R. Moxley, T. Klopfenstein and S. Hinkley **NEB 14-127**

The specific aims of this project are: 1) to field test the effect of vaccination and feeding direct-fed microbials for singular, additive or interactive effects on the prevalence of *E. coli* O157:H7 in feedlot cattle; and 2) to share our findings with cattle producers, veterinarians, food safety researchers, food safety policy makers, and other stakeholders through extension programming.

This study was recently funded. We are currently making plans with cooperating privately-owned feedyards to begin enrolling pens of cattle beginning in the Spring of 2004. In total we anticipate enrolling 160 pens of cattle, totaling approximately 24,000 cattle.

IMPACT STATEMENT

This study will help the cattle industry make decisions about the effectiveness of using these interventions to reduce E. coli O157:H7 in live cattle.

Regulation of the Latency-Reactivation Cycle by the Bovine Herpesvirus 1 (BHV-1) Latency Related (LR) Gene

C. J. Jones and A. R. Doster

NEB 14-128

New project - No progress report.

● INTERNATIONAL ACTIVITIES ●

➢Fernando A. Osorio, MV, MS, PhD

During the week of April 28 through May 4, 2003, Dr. Osorio received two international visitors, Drs. Valentina Moreno and Myriam Rojas. During their visit, they stayed in the VDC diagnostic virology laboratory and in Fernando's research lab in VBS, ascertaining all that pertains to PRRSV detection and serology. Drs. Moreno and Rojas works for SAG, which is the official Chilean laboratory in charge of the eradication of PRRSV in that country. The two Chilean visitors started their US trip in PIADC the week of April 22, where they experienced all that is associated to Hog Cholera techniques, a disease from which Chile is free from. The trip of the two visitors was paid for by the Chilean Pork Producers Association.

➢Gerald E. Duhamel, DVM, PhD

Dr. Duhamel has generated preliminary data and submitted an R03 grant application to the NIAID/NIH with Dr. Christian Lindboe in the Department of Pathology, Sørlandet Sykehus, Kristiansand, Norway on colitis of humans. He has generated additional preliminary data together with Dr. Roger Willen in the Centre for Laboratory Medicine, University Hospital, Uppsala, Sweden and Dr. Adriana Calderaro in the Department of Pathology and Laboratory Medicine, University of Parma, Italy, regarding the same topic. In addition to his on-going research collaborations with Dr. Tim K. Jensen of the Danish Veterinary Laboratory, Denmark on the detection of pathogenic intestinal spirochetes in tissues by immunohistochemistry and *in situ* hybridization, he has worked with Dr. Pedro Rubio of the Universidad de León, Spain on pathogenic intestinal spirochetes of swine and Dr. Claes Fellström at the Swedish University of Agricultural Sciences, Uppsala, Sweden on the characterization of canine intestinal spirochetes.

➢Marjorie F. Lou, MS, PhD

Dr. Lou is the founder and organizer of the Asian Cataract Research Conference. She continues to organize the biannual conferences held in the major city of Asia. The fourth conference was held in ShengYang, China, June 28-30, 2002. She is actively promoting and sponsoring lens and cataract research programs in Asian countries, such as South Korea, Hong Kong, China, India, Pakistan and Singapore.

Dr. Lou is an elected representative for North America to direct the scientific program for the Lens Section for Annual European Eye and Vision Research Conference at Alicante, Spain, October 2001 and 2002. She has been re-elected for the same post for October 2003-2004.

≫Subramaniam Srikumaran, BVSc, MS, PhD

Dr. Sri has an on-going collaboration with the Madras Veterinary College at the Tamil Nadu Veterinary and Animal Sciences University, India. Under this collaboration, he serves as a consultant for the project entitled "Center of Excellence in Veterinary Biotechnology and Immunology," sponsored by the World Bank-funded National Agricultural Technology Project of India. His collaboration has resulted in one publication this year, Dhinakar Raj et al., 2003 (see publication's section).

Dr. Sri also serves as an external examiner for the Dissertation Defense Examination Committee for a PhD candidate in the Department of Veterinary Microbiology, Western College of Veterinary Medicine, University of Saskatchewan, Saskatoon, Saskatchewan, Canada, September 23rd, 2003.

● Veterinary Extension Program ●

Topics/Titles of Extension Program Emphases

» D. Dee Griffin

• Develop educational programs and materials and conduct applied research for feedlot veterinarians, producers, and individuals in the feeding cattle industry of Nebraska and the nation. The focus of these activities are directed toward pre-harvest food safety, animal care, production management and economics, biosecurity and premise security

» David Smith

•Security medicine as a paradigm for practicing veterinarians
•On-farm food safety, especially *E. coli* O157:H7 and *Salmonella* spp.
•Foreign animal diseases and bioterrorism
•Biosecurity for cattle production systems, especially Johne's disease and bovine viral diarrhea virus
•The evaluation and interpretation of diagnostic tests at the individual and herd level
•Modeling approaches for biosecurity
•Bovine spongiform encephalopathy

Extension Faculty Programs

» D. Dee Griffin, DVM, MS — Feedlot Veterinarian

The beef industry has had a roller coaster ride for the last year. The profit potential for fed cattle at the beginning of the year looked brighter than in any of the previous 30 years. This extended the lack of the recovery from a depressed national cattle inventory and because of this cattlemen received record high prices toward the end of the year. The health of incoming cattle during this time was very poor and severely affected the profit potential because of health costs and decreased gains and efficiency performance. The diagnosis of BSE in December caused the cattle market to take a severe plunge, but because of extremely good issues management from the USDA and NCBA consumer confidence remained high, in fact the data suggest confidence actually improved post BSE diagnosis.

Nebraska cattlemen and Nebraska State Department of Agriculture continue progress on biosecurity training. Our efforts at GPVEC, including biosecurity Internet site improvement have been recognized by the USDA. We were awarded an significant educational grant. Many of the materials are available at http://www.FarmAndRanchBiosecurity.com (a UNL server).

Pre-harvest beef quality assurance (BQA) and Pre-Harvest Hazard Analysis Critical Control Point (PH-HACCP) education programs development continues to receive my major effort. We have received a significant grant for development of a Pre-Harvest Antibiotic Screening Test (PHAST) and is making good progress.

The integration of teaching and applied field research in my extension activity with the veterinarians serving Nebraska and national beef operations continues to be successful. This year our efforts along with the efforts of private practicing veterinarians has developed a national organization to address the declining numbers of rural veterinarians. The newly organized group has attracted significant funding. Information about the group's activities can be found at http://www.RuralVets.com (a UNL server).

» David Smith, DVM, PhD — Dairy and Beef Cattle Veterinarian

An important focus of my extension and research programming is communicating and applying the principles of biosecurity and pathogen-containment especially as they relate to protecting both cattle and public health. I have emphasized population diagnostics and the role of animal production systems on transmission of cattle diseases and human food-borne pathogens. I plan and moderate meetings each week to discuss current issues in livestock and public health related to animal production systems. The meetings foster collaboration and communication between faculty, regulatory veterinarians, public health officials and veterinarians, and seek to devise research strategies and solve animal or human health problems related to livestock production. Field research projects are underway to better understand how to control bovine viral diarrhea virus and Johne's disease in cow-calf operations, and *Escherichia coli* O157:H7 and *Salmonella* in feedlot cattle. I also conducted animal disease outbreak investigations on Nebraska cattle operations related to calf scours, dairy productivity, health and mastitis. I contribute lectures on population medicine to graduate, professional, and undergraduate courses.

● Nebraska Veterinary Diagnostic Laboratory Center (VDC) ●

OVERVIEW

The Veterinary Diagnostic Center (VDC) in Lincoln is an AAVLD accredited full service diagnostic laboratory.

VISION

The vision of the Nebraska Veterinary Diagnostic Center is to enhance the economic vitality and life quality for all Nebraskans by promoting healthy livestock and companion animals, enhancing the safety of animal derived consumer products and protecting wildlife resources.

MISSION

The Diagnostic Laboratories mission is to assist veterinarians, their clients, and others responsible for animal and public health in the detection, prevention and understanding of disease. The faculty and staff will approach this task by providing accessible, accountable, timely and accurate diagnostic services, and by sharing information generated through scholarly publication, meeting presentations, and by direct communication.

OBJECTIVES

- To provide accessible, accountable, timely, and accurate diagnostic, research and information services to veterinarians, animal owners, food producers and animal health industries.
- To provide proactive investigational support to enhance population approaches to, and efficiency of diagnostic testing.
- To implement modern biotechnology methods where appropriate into diagnostic service.
- To monitor and report the incidence and threat of animal diseases as well as diseases that are transmissible from animals to humans.
- To share new information with colleagues through publication in a manner that respects the confidentiality of clientele.
- To prioritize research activities, in applied areas, (epidemiology, diagnostic techniques, emerging diseases) and areas of current concern.
- To cooperate with extension, teaching and research programs of IANR.
- To maintain affordable diagnostic testing to assure sufficient case numbers that support disease surveillance functions and to maintain access to research materials (tissues, field isolates etc.) and current information on disease prevalence and trends.

- To enhance communication with target clientele toward accessing their needs and providing services based on those needs.

- To communicate with clientele educating them on population approaches to diagnostics, current testing technologies and to implement a marketing plan.

Immunohistochemistry, BVDV, West Nile virus and prion protein detection activities remained stable. PCR detection methods grew slightly. The lab increased contract testing for NVSL on prions. Equipment was upgraded for pathologist with each regular full time pathologist having now an excellent microscope and digital imaging system. Additional equipment freezers and incubators were purchased to support a growing Johne's program and a large state survey project. An excellent anaerobic chamber was acquired to enhance isolation of diagnostically important anaerobes. We also started recycling formalin. Disposal of animal remains is a growing problem as fee's are increasing and the list o unacceptable materials for rendering has increased related to BSE concerns.

Consolidation of toxicology laboratory resources into a smaller space was completed. GC-Mass spectroscopy was removed and an arrangement was sought with the water center for those services. The lab received tentative approval for 309 funds to replace the outdated HVAC system. Operations were suspended one day due to unsuitable laboratory temperatures and supplementary portable heaters were needed for much of the winter to keep ELISA and IHC labs operational.

To somewhat accommodate for the work load related to lab closures a full time six month pathology position was created and filled with a temporary employee from December to thru May. The residency program is being considered to address the pathology staffing needs. A quality manager was hired to address new AAVLD requirements and a Quality manual was drafted. Implementation of quality program is in progress. Monthly QA meetings were instituted in addition to faculty manager meetings and monthly manager staff meetings.

Diagnostic faculty became involved in undergraduate advising and recruitment in 2003 adding another time commitment. The lab was also busy cooperating with state agencies on homeland security issues and bioterrorism concerns. The Poultry pathologist position was vacated and subsequently cut due to budget concerns again adding to the duties of remaining faculty. Animal science hired a staff level person to assist with flock visits and sample acquisition for the poultry industry and a poultry fee schedule was developed to demonstrate some provision of service to this large agricultural group.

Specific activities of the NVDLS are summarized in the following pages.

Table 4. ACCESSIONS BY SPECIES BY MONTH (January 2003-December 2003)

NEBRASKA VETERINARY DIAGNOSTIC LABORATORY - Lincoln, Nebraska

Species	Jan.	Febr.	Mar.	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	TOTAL	% OF TOTAL
Avian - Chicken	1	1	3	6	5	4	5	5	3	5	6	6	50	0.33
Avian - Misc.	56	9	21	27	72	224	283	258	232	103	28	20	1335	8.71
Avian - Turkey	1	1	1	2	1	0	0	0	1	1	0	1	9	0.06
Bovine	573	643	824	804	654	458	452	374	487	636	534	620	7,059	46.05
Canine	233	205	207	267	225	239	248	249	227	257	189	237	2,783	18.15
Caprine	2	2	3	7	1	2	2	7	9	6	1	3	45	0.29
Equine	32	30	78	97	97	76	99	101	87	70	29	25	821	5.36
Feed & Water	8	0	4	4	4	0	5	6	5	2	3	1	41	0.27
Feline	53	49	47	48	55	60	50	58	64	62	41	47	634	4.14
Ovine	6	8	12	12	9	6	4	9	22	9	13	7	117	0.76
Porcine	83	67	63	69	68	58	72	52	69	66	46	55	768	5.00
Porcine - PRV	125	101	123	98	69	66	63	74	68	67	45	56	955	6.23
Misc. Mammal	41	43	32	54	38	31	50	35	55	46	127	83	636	4.15
Misc.	3	7	10	5	7	15	4	9	3	7	3	6	77	0.50
TOTAL	1,217	1,166	1,428	1,500	1,305	1,239	1,337	1,237	1,332	1,337	1,065	1,167	15,330	100.00

Table 5. SUMMARY OF LABORATORY PROCEDURES (January 2003-December 2003)

NEBRASKA VETERINARY DIAGNOSTIC LABORATORY

PROCEDURE	Jan.	Febr.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Necropsies	84	57	59	44	35	55	116	80	28	66	24	49	697
Histology	3,320	4,683	3,727	3,735	3,325	3,684	4,417	4,568	2,870	3,428	2,467	3,837	44,081
Bacteriology	3,129	3,784	4,922	4,237	3,455	2,344	2,973	2,728	2,720	3,565	2,856	2,384	39,113
PCR/RFLP/Sequencing	132	82	86	118	259	265	535	333	269	190	107	95	2,466
Mycology	4	2	5	5	3	7	3	3	7	10	11	7	67
Sensitivity Tests	148	170	221	189	173	114	118	134	121	201	149	139	1,877
FA Tests (Bact.)	1	4	14	24	0	2	1	5	3	4	3	2	63
FA Tests (Viral)	40	49	90	30	11	15	4	9	0	21	7	4	280
EM Exams	19	47	71	10	7	4	2	4	4	4	5	7	184
Toxicology	158	244	258	214	93	87	84	85	63	95	136	58	1,575
Parasitology	177	194	198	195	290	76	194	59	223	46	136	139	1,927
Clinical Pathology	19	10	14	10	12	15	11	15	14	17	10	10	157
Bacterial Serology	144	315	245	130	39	31	45	87	44	39	100	31	1,250
Viral Serology	2,535	2,261	4,104	2,738	2,022	1,613	2,078	1,779	1,916	3,273	3,038	2,612	29,969
Avian Serology	1,468	377	1,035	995	265	0	1,361	1,366	515	5	522	1,792	9,701
Immunohistochemistry	92	102	116	84	86	118	130	170	36	78	58	72	1,144
BVD Skin Biopsy	12,444	13,306	15,953	22,757	17,329	12,117	12,314	10,083	13,411	18,429	14,432	15,773	178,377
CWD	2,012	147	25	4	6	1	4	5	13	14	3,912	1,045	7,188
Scrapie	1	0	1	192	1	0	0	0	557	300	292	0	1,344
West Nile Swab Tests						142	102	61	0	0	0	0	305
Virus Isolation	52	83	83	79	45	35	48	26	43	108	71	73	747
VI - BVD Microtiter	10	0	0	0	0	0	0	0	0	2	0	0	12
BCV, BVD & Rota Elisa	351	263	357	271	160	151	180	112	92	38	11	24	2,010
Pseudorabies	4,227	3,042	5,009	3,676	3,268	1,947	1,827	1,597	1,919	1,984	1,412	1,668	31,595
TOTAL for MONTH	30,567	29,222	36,593	39,737	30,884	22,823	26,547	23,313	24,868	31,917	29,759	29,821	356,129

Table 6. Number of Accessions, Previous Five Years**

	1999	2000	2001	2002	2003
Lincoln	10,915	11,835	14,463	16,298	15,330
North Platte	570	441	650	795	
Scottsbluff	1,088	1,239	1,409	644	
TOTAL	12,573	13,525	13,525	17,737	15,330

**Totals from 1999 through 2002 included totals from the North Platte and Scottsbluff Labs. (The Scottsbluff lab was closed as of June 30, 2002 and the North Platte lab was closed as of December 30, 2002 due to budget constraints)

Table 7. Number of Laboratory Procedures Conducted, Previous Five Years

	1999	2000	2001	2002	2003
Lincoln	262,388	274,174	326,288	342,634	356,129
North Platte*	5,954	5,005	7,708	8,477	
Scottsbluff*	13,135	13,852	16,452	6,276	
TOTAL	281,477	293,031	350,448	357,387	356,129

*North Platte and Scottsbluff totals include referral testing that was sent to the Lincoln laboratory. (Also see note above in regard to closing of Scottsbluff and North Platte labs.)

Table 8. LAG TIME REPORT
Veterinary Diagnostic Center
January 1, 2003 - December 31, 2003

Number of Days to Report	Normal Accessions % Reported (Cumulative %)				Pseudorabies Accessions % Reported (Cumulative %)				All Accessions % Reported (Cumulative %)			
	First Report		Final Report		First Report		Final Report		First Report		Final Report	
	Given	%	Sent	%	Given	%	Sent	%	Given	%	Sent	%
0	10.3	10.3	10.3	10.3	38.1	38.1	38.1	38.1	13.2	13.2	13.2	13.2
1	23.7	34.0	23.9	34.2	37.1	75.2	37.1	75.2	25.1	38.3	25.3	38.5
2	16.7	50.7	14.9	49.1	6.1	81.3	6.1	81.3	15.6	53.9	14.0	52.5
3	15.7	66.5	14.2	63.3	7.2	88.6	7.1	88.4	14.8	68.7	13.5	65.9
4	10.2	76.7	10.5	73.8	6.5	95.1	6.5	95.0	9.8	78.6	10.1	76.0
5	7.6	84.2	8.8	82.6	2.0	97.1	2.0	97.0	7.0	85.6	8.1	84.1
6	5.3	89.5	5.8	88.4	1.8	98.8	1.9	98.8	4.9	90.5	5.4	89.5
7	2.4	91.9	3.1	91.6	0.3	99.2	0.3	99.2	2.2	92.7	2.9	92.3
8	1.1	93.1	1.5	93.1	0.1	99.3	0.1	99.3	1.0	93.7	1.4	93.7
9	0.5	93.6	0.7	93.8	0.0	0.0	0.0	0.0	0.5	94.2	0.7	94.4
10	0.7	94.3	0.7	94.5	0.0	0.0	0.0	0.0	0.6	94.8	0.6	95.0
11-15	1.3	95.6	1.5	96.0	0.3	99.6	0.3	99.6	1.2	96.0	1.3	96.4
16-20	0.9	96.5	0.9	96.9	0.0	0.0	0.0	0.0	0.8	96.8	0.8	97.2
21-30	1.7	98.2	1.7	98.6	01.	99.7	01.	99.7	1.6	98.3	1.6	98.7
31-50	0.6	98.8	0.4	99.0	0.0	0.0	0.0	0.0	0.6	98.9	0.3	99.1
Over 50	1.2	100.0	1.0	100.0	0.3	100.0	0.3	100.0	1.1	100.0	0.9	100.0

NOTE: Weekends and holidays are included in this report. If a case is not called or FAXed out, it will have no record of a first report date.
Research cases may or may not have a first and final report date.

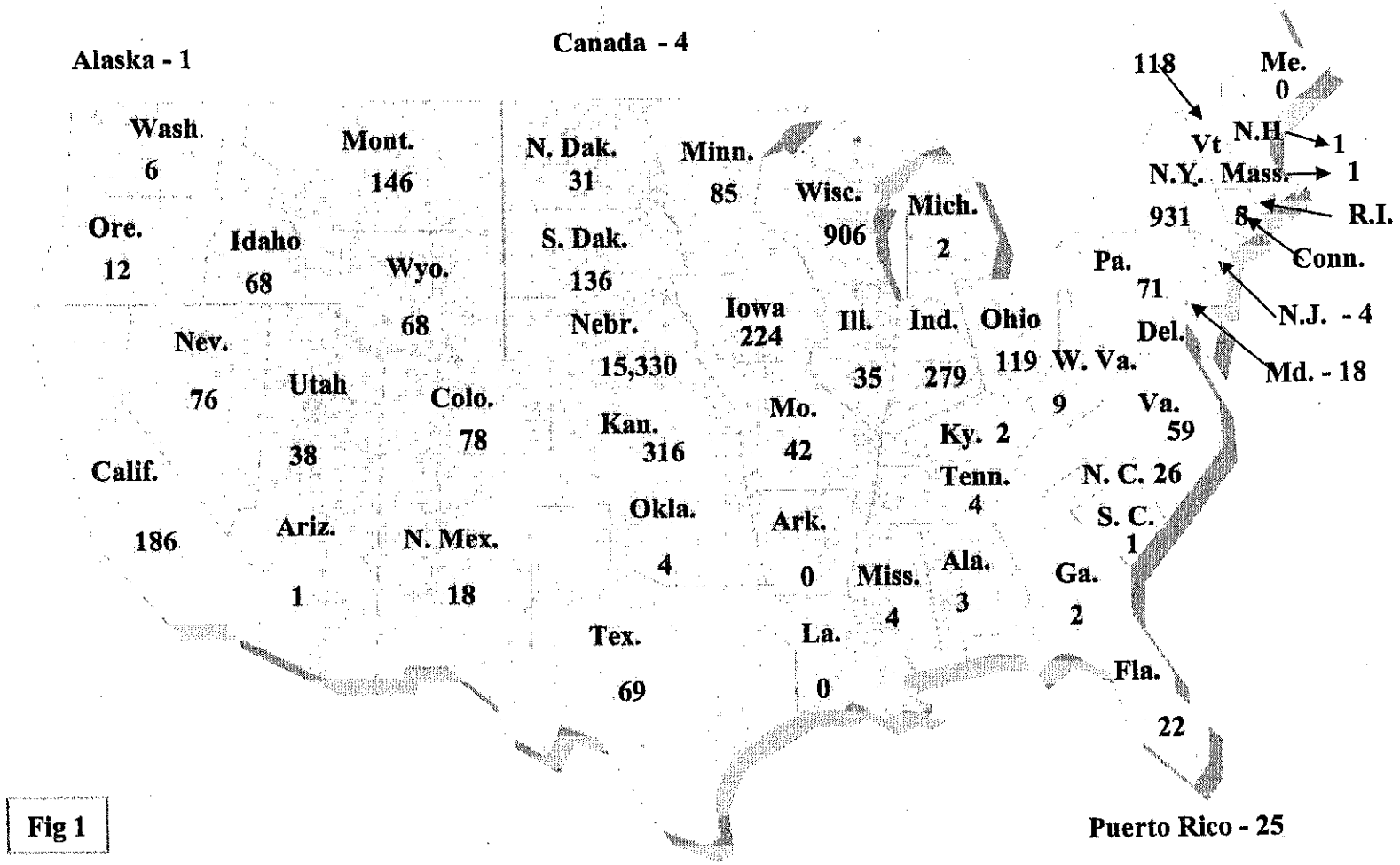

Fig 1

Distribution of Accessions by State

NVDLS

January 2003 - December 2003

Distribution of Accessions by County

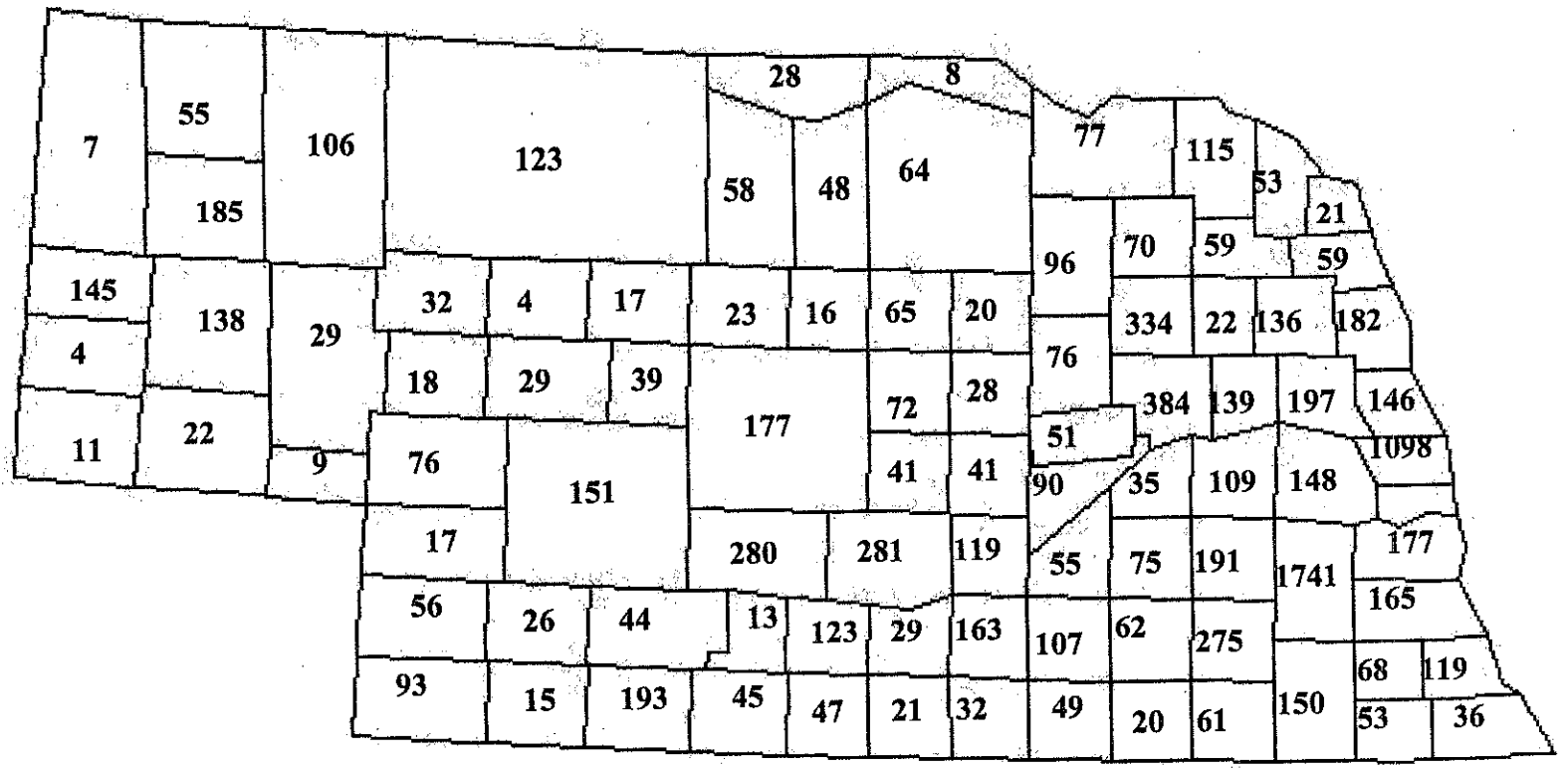

Fig2

January 2003 - December 2003

● VBMS GRANTS AND CONTRACTS PROGRAM ●

Active Grants and Contracts Funded in 2003

A New Approach to Control of Human Pathogenic Fungi: Investigation of Farnesol and Farnesol Analogs in a Mouse Model

KW Nickerson and GE Duhamel. 2003. Tabacco Settlement Biomedical Research Enhancement Fund Research, Seed Grant Program, $15,000

An Accurate Determination of the Proportion of Beef Cattle with Johne's Disease and the Factors Explaining Herd Status

Smith DR. USDA/APHIS VS Johnes Disease Cooperative Agreement; 10-03/10-04; $100,000

Bovine Genetics Quality Assurance

D Steffen. National Association of Animal Breeders, 2003-2004; $12,000

Chronic Wasting Disease Surveillance in Deer

D Steffen. Nebraska Game and Parks Commission. 2002 estimated 5,000 samples; actual contract value FY03, $85,000

Colonic Spirochaetal Infections in Animals and Humans

GE Duhamel. 2003. 2nd International Conference, Edinburgh, United Kingdom; Novartis Animal Health US, Inc., $1,000

Competitive Exclusion as an *E. coli* O157:H7 Intervention Strategy Phase II

Klopfenstein TJ, Smith DR, Moxley RA, Erickson, Hinkley S. Nutrition Physiology Corp; 05-2003/12-2003; $50,000

Control of Johne's Disease

D Steffen. Nebraska Department of Agriculture, FY04; $25,000

CWD Validation of the ELISA Assay For Use in White-Tailed Deer

D Steffen. Bio-Rad 2002-2003; reagents $60,600 (CWD test kits) 2002-2003; equipment plate reader and two ribolyzers $35,803; total value $100,803

Evaluation of Anthrax Rapid Detection Kits

D Steffen. Nebraska Department of Agriculture, FY04, $475.00

Evaluation of Automated Meat Recovery Systems

D Steffen. Subcontract Dr. Thipareddi, Department of Food Science and Technology, $7,430

Genetic Disease Diagnosis and Consulting
D Steffen. American Simmental Association, $4,900

Hepatitis C Virus Replication
RO Donis. Nebraska Center for Virology, 07-01-02/06-30-03; $5,000

Howard Hughes Medical Institute Fellowship for Summer Undergraduate Research
GE Duhamel. 2003. 4 Senior Undergraduate Projects, Nebraska Wesleyan University; $10,000

Identification and Characterization of Mycobacterium paratuberculosis Virulence Genes Expressed in vivo by Negative Selection
NY Shpigel, I Rosenshine, M Chaffer and RG Barletta. USDA, Binational Agricultural Research and Development Fund; 12-31-03/12-31-04; $100,000

Induction of Protective Immunity Against Systemic BVDV1 and BVDV2 Infection
Kelling CL and Steffen DJ. Schering-Plough Animal Health, $144,000

International Reference Laboratory for Spirochetal Colitis Research
GE Duhamel. 2003. University/Industry/Practitioners; $1,275

Intervention Strategies to Reduce *Escherichia coli* O157:H7 in Beef Feedyards
DR Smith, GE Erickson, RA Moxley, T Klopfenstein and S Hinkley. USDA Integrated Research, Education and Extension Competitive Grants Program, National Integrated Food Safety Initiative, 10-30-03/10-29-06; $500,000

Johne's Disease Herd Testing
D Steffen. Nebraska Department of Agriculture, FY03, $1,009

Lifetime Use of Feed Grade Antimicrobials
Brumm MC and Brodersen BW. Elanco Animal Health

Molecular Characterization and Pathogenesis of *Francisella tularensis*
GE Duhamel. 2003. University of Nebraska-Lincoln and University of Nebraska Medical Center Research Collaboration Grant Program, $100,000

Monoclonal Antibodies
GE Duhamel. 2003. Departmento Patologia Y Medicina Preventiva, Facultad de Medicina Veterinaria Universidad de Concepción, Chillan, Chile; $223

Pathogenesis of Porcine Circovirus
Brodersen BW and Hesse RA.. Collaborative study with Intervet, $1500

Production of Mouse X Porcine Neutralizing Antibodies Anti-Porcine Reproductive and Respiratory Syndrome Virus
FA Osorio. 2003/2004. PIC USA (Sygen International); $44,955

Production and Characterization of Group A Bovine Rotavirus Challenge Material in Gnotobiotic Calves

GE Duhamel. 2003. Novartis Animal Vaccines, Inc., $13,854

Protein-Thiol Mixed Disulfides in Cataractogenesis

Marjorie F. Lou. National Institute of Health, 10-01-03/06-30-07; $1,794,300

Pseudorabies Eradication and Control

D Steffen. Nebraska Department of Agriculture testing, FY03, $22,994

Regulation of the Latency-Reactivation Cycle by the Bovine Herpesvirus 1 (BHV-1) Latnecy Related Gene

CJ Jones. 2003. USDA, National Research Initiative Competitive Grants Program, 11-01-2003/10-30-2006, $320,000

Role of Nonstructural Proteins in Pestivirus Assembly

RO Donis. NIH; 09-30-03/09-29-04; $289,116

Safety Testing of Rotavirus Vaccine in Gnotobiotic Calves

CL Kelling and GE Duhamel. 2004. Merck & Co., Inc., $134,784

Transmission of Bovine Viral Diarrhea Virus Via Semen from Bulls with Persistent Testicular Infection

MD Givens, AM Heath, DA Stringfellow, KV Brock, TD Braden, BW Brodersen. USDA/CSRS, $212,534

USDA Contract Scrapie Program

D Steffen. November 2002 to present, $61,000

Vaccination as an *E. coli* O157:H7 Intervention Strategy - Phase II

Klopfenstein TJ, Smith DR, Moxley RA, Erickson, Hinkley S. Nebraska Beef Council, 01-2003/09-2003; $50,000

Viral Pathogens that Contribute to Respiratory Disease Complex in Cattle: Epidemiology of Persistent BVDV Infections

Brodersen BW. USDA/ARS Extramural Agreement; $25,000

Vitamin-Dependent Modifications of Histones

Janos Zempleni, Marjorie F. Lou. 2003-2007, National Institute of Health, $1,087,586

West Nile Surveillance and Serologic Response in Horses

D Steffen. Nebraska Department of Agriculture, FY04, $2,940

West Nile Surveillance in Birds

D Steffen. Nebraska Department of Health and Human Services, Centers for Disease Control; subcontract FY04/October 3, 2003, $34,880

EQUIPMENT FUNDING

INDUSTRY

Genetic Resistance to Porcine Reproductive and Respiratory Syndrome Virus (PRRSV)

Johnson R, Osorio FA, Doster AR. Nebraska Pork Producers Association; 09-01-02/03-31-04; $25,000

INTRAMURAL

Molecular Characterization and Pathogenesis of *Francisella tularensis*

Jeffrey Cirillo, Steve Hinrichs, Raul Barletta, Andy Benson, Paul Fey, Peter Iwen, Mark Griep, Gerald Duhamel and Tom Jerrolls; UNMC/UNL Collaborative Research 2003; $100,000

ACTIVE GRANTS AND CONTRACTS CONTINUED FROM PREVIOUS YEARS

A Novel Strategy to Test and Monitor Beef Feedlot Food-Safety Control Points
D Smith, L Hungerford, J Gray, R Moxley, T Klopfenstein, C. Milton, S. Hinkley. USDA/CSREES (NEB 14-111); 11-2000/10-004; $953,735

A New Approach to Control of Human Pathogenic Fungi: Investigation of Farnesol and Farnesol Analogs in a Mouse Model
KW Nickerson and GE Duhamel. 2001-2002. Tabacco Settlement Biomedical Research Enhancement Fund Research, Seed Grant Program, $30,000

Analysis of Mycobacterial Virulence Determinants
Luiz Bermudez and Jeffrey D. Cirillo, NIH/NIAID; 08-01-99/9-30-04; $1,632,215

Bovine Genetics Quality Assurance
D Steffen. National Association of Animal Breeders, 2002-2003; $12,000

Chronic Wasting Disease Surveillance in Deer
Brodersen, BW. Nebraska Game and Parks Commission 2002/2004; estimated total value $198,000 based/test $22.50; anticipated FY 2002/2003, $66,000

Competitive Exclusion and Vaccination as *E. coli* O157:H7 Intervention Strategies
D Smith, T Klopfenstein, R Moxley, G Erickson and S Hinkley. Nebraska Beef Council, . 05-01-02/12-31-02; $50,000

Competitive Exclusion and Vaccination as *E. coli* O157:H7 Intervention Strategies
D Smith, T Klopfenstein, R Moxley, G Erickson and S Hinkley. Nutrition Physiology Corp., 05-01-02/12-31-02; $41,700

Develop Pre-Harvest Version of the USDA-FSIS FAST Antibiotic Screening Test and Antibiotic Residue Avoidance Education
DD Griffin, S Hinkley and H Cerny. USDA Integrated Research, Education and Extension Competitive Grants Program, National Integrated Food Safety Initiative (NEB 14-123). 09-2002/09-2005; $185,746

Effect of Virus Infection on Cellular Glutathione Concentration
Brink DR, Matulka L, Kelling CL and Srikumaran S. 2002-2003. ARD Interdisciplinary Research Grant Proposal, $20,000

Entry Mechanisms of *Mycobacterium marinum*
Jeffrey D. Cirillo, NIH/NIAID; 09-01-02/2-28-07; $1,305,000

Evaluation of Intervention Strategies to Reduce the Prevalence of Fecal Shedding of *E. coli* O157:H7

D Smith, T Klopfenstein, R Moxley, L Hungerford, S Hinkley, M Brashears and S Younts, Nutrition Physiology Corp., 03-26-01/09-30-02; $50,000

Evaluation of Intervention Strategies to Reduce the Prevalence of Fecal Shedding of *E. coli* O157:H7

D Smith, T Klopfenstein, R Moxley, L Hungerford, S Hinkley, M Brashears and S Younts. Nebraska Beef Council, 03-26-01/09-30-02; $100,000

Evaluation of Commercially Available Serologic Marker Systems for Foot-and-Mouth Disease

FA Osorio. 2002-2005. Specific Cooperative Agreement USDA/ARS, $97,700

Evaluation of GABA-like Compounds

Peter Kador and MF Lou. Merck Company, $272,282

Evolving Pathogens, Targeted Sequences, and Strategies for Control of Bovine Respiratory Disease

S. Srikumaran. 2001-2006. NC-107 Regional Research Funds, USDA

Functional Genomic Analysis of Bovine Viral Diarrhea Virus

RO Donis. USDA.; 12-01-01/11-30-04; $275,000

Nebraska EPSCoR Infrastructure Improvement Grant

R Ballinger, RO Donis and others. NSF; 02-01-00/02-01-03; $2,900,000

Functional Analysis of bICP0, a BHV-1 Gene that is a Promiscuous Trans-Activator

CJ Jones. USDA, National Research Initiative Competitive Grants Program; 09-01-2002/08-30-2005, $300,000

Functional Genomic Analysis of Mycobacterium Paratuberculosis

JP Bannantine, V Kapur, S Wells, RG Barletta and JR Stabel. USDA National Research Initiative Competitive Grants Program; 09-01-02/08-31-04; $285,000

Genetic Resistance to Porcine Reproductive and Respiratory Syndrome Virus (PRRSV)

Johnson R, Osorio F, Doster AR. 2002-2003. Nebraska Pork Producers Association, $25,000

Gp96 as a Molecular Chaperone for Antigen Selivery in Viral Systems

S Srikumaran and CL Kelling. 2002. USDA NRICGP; $200,000

Income from Sale of Monoclonal Antibodies

GE Duhamel. 1998-2003. University/Diagnostic Laboratories; $498

Income from International Reference Laboratory for Spirochetal Colitis Research
GE Duhamel. 1995-2003. University/Industry/Practitioners; $23,390

Induction of Protective Immunity Against Systemic BVDV1 and BVDV2 Infection
Kelling CL and Steffen DJ. Schering-Plough Animal Health; $144,000

Inhibition of Apoptosis by the Bovine Herpesvirus 1 Latency Related Gene
Jones CJ, AR Doster. USDA National Research Initiative Competitive Grant Program (NRICGP); 10-20-00/9-30-03; $292,000

Integrating Biosecurity Practices into Livestock Production Management on Farms and Ranches to Ensure a Sustainable and Wholesome Food Supply
Rupp G, Griffin DD, Hungerford LL, Smith DR. USDA/CSREES Higher Education Challenge Grant; $249,792

Mapping of Mannheimia (Pasteurella) Haemolytica Leukotoxin Binding Site(s) on Bovine CD18
S Srikumaran. 2002-2004. USDA NRICGP; $131,000

Molecular Characterization and Pathogenesis of *Francisella tularensis*
GE Duhamel. 2002. University of Nebraska-Lincoln and University of Nebraska Medical Center Research Collaboration Grant Program, $118,000

Molecular Characterization of *Moraxella bovis* and *Branhamella ovis* Field Isolates by Plasmid Analysis and Restriction Enzyme Analysis
Hinkley S, Cerny HE and Nabity PS. Grand Laboratories, 08-2001; $2,100

Molecular Characterization and Pathogenesis of *Francisella tularensis*
M Meagher, S Hinrich, P Fey, T Jerrell, P Iwen, A Benson, RG Barletta, JD Cirillo, G Duhamel, M Griep. UNMC-UNL Interdisciplinary Research; 09-1-02/6-30-03; $100,000

Mycobacterial Drug Resistance
RG Barletta. Research in Microbiology Immunology and Infectious Diseases Foundation (Medical Research Institute of San Francisco at California Pacific Medical Center, Kuzell Institute for Arthritis and Infectious Diseases); 10-95/6-03; $4,500

Protective Immunity Against PRRSV Obtained by Passive Administration of Antibodies: Optimization of the Conditions
FA Osorio. 2002-2003. National Pork Producers Council, $25,000

Protein-thiol Mixed disulfides in Cataractogenesis
Marjorie F. Lou. National Institute of Health; 02-01-99/09-30-03; $1,286,072

Redox Biology Center Cobra Grant
Ruma Banerjee and Marjorie F. Lou. NIH. 2002-2007; $8,269,843

Role of *E. coli* Heat-labile Enterotoxin-I in Diarrhea and Septicemia in Swine

RA Moxley and RG Barletta. USDA, National Research Initiative Competitive Grant Program (Sustaining Animal Health and Well Being); 11-01-98/10-31-03; $140,000

Role of A/E Proteins in *E. coli* O157:H7 Intestinal Colonization of Adult Cattle

RA Moxley. USDA-CSREES-NRICGP. 12-1-01/11-30-04; $370,000

Role of Macrophages in the Pathogenesis of Porcine Colonic Spirochetosis

GE Duhamel and JD Cirillo. 2004. USDA, National Research Initiative, Competitive Grant Program, Animal Health and Well-Being, $240,000

Role of PRRSV-Specific Antibodies in Protective Immunity Against Porcine Reproductive and Respiratory Syndrome Virus Infections

FA Osorio. 2002-2004. National Research Initiative Competitive Grant Program/USDA/ Sustaining Animal Health and Well-Being, $200,000

Role of Macrophages in the Pathogenesis of Porcine Colonic Spirochetosis

Gerald Duhamel and Jeffrey D. Cirillo, USDA, 09-01-00/8-31-04; $239,998

Scrapie Program

BW Brodersen. 2002. USDA competitive contract award for Scrapie program support at $15 per test commitment for 5,000 and agreement for up to 10,000 tests per year. Estimated gross revenues, $75,000-150,000/year

Second Governor's Conference on Ensuring Meat Safety: *E. coli* O157:H7 — Progress and Challenges

R Hutkins, A Benson, R Moxley. USDA Integrated Research, Education and Extension Competitive Grants Program (Conference Grant). 10-01-02/09-30-03; $38,150

Targeting *M. tuberculosis* Alanine Ligase for Drug Design

RG Barletta. NIH; 08-01-02/7-31-04; $145,000

The Role of *Chlamydia suis* in Conjunctivitis in Pigs

DG Rogers. USDA. 08-27-99/08-15-2002; $15,000

Up-Regulation of K+Channels in the Remodeled Ventricle

George J. Rozanski and Marjorie F. Lou. National Institute of Health; 10-01-00/09-30-04; $1,081,579

Use of Beneficial Plant-Microbe Interactions to Enhance Biomass Yield, and Economic Value and Sustainability of Agricultural Products

AK Vidaver, RG Barletta, PH Blum and TJ Klopfenstein. Strategic Research Cluster Grant, University of Nebraska Lincoln; 08-01-02/6-30-03; $10,000

Viral Pathogenesis
CJ Jones. NIH COBRE; 10-2000/10-2005; $10,400,000; $83,000/year

VSV RNA Transcription and Replication
Asit K Pattnaik; NIAID/NIH; NIH grant is being transferred from the University of Miami to the University of Nebraska-Lincoln, 03-01-01/02-28-06; $1,495,690

Whole-genome Sequencing and Analysis of *Lawsonia intracellularis*
V Kapur, CJ Gebhart and GE Duhamel. 2000-2003. USDA, Initiative for Future Agriculture and Food Systems, $997,962

Intramural

Molecular Characterization and Pathogenesis of *Francisella tularensis*
Jeffrey D. Cirillo, Steve Hinrichs, Raul Barletta, Andy Benson, Paul Fey, Peter Iwen, Mark Griep, Gerald Duhamel and Tom Jerrolls; UNL/UNMC; $100,000

Foundation

Invasion of Host Cells by *Legionella pneumophila*
Jeffrey D. Cirillo; 01/01/97-indefinite; Center for Indoor Air Research, $387,573

GRANT PROPOSALS SUBMITTED IN 2003

A New Approach to Control of Human Pathogenic Fungi: Investigation of Farnesol and Farnesol Analogs in a Mouse Model

KW Nickerson and GE Duhamel. 2003. Tabacco Settlement Biomedical Research Enhancement Fund Research, Seed Grant Program, $15,000

***Acanthamoeba*-Pathogen Interactions Mutant Analysis**

Jeffrey D. Cirillo; NIH/NIAID; 04-01-04/03-01-09; $1,631,250

An Accurate Determination of the Proportion of Beef Cattle with Johne's Disease and the Factors Explaining Herd Status

Smith DR. USDA/APHIS VS Johnes Disease Cooperative Agreement; 10-03/10-04; $100,000

Analysis of LAT's Antiapoptosis Activity

CJ Jones. NIH, submitted March 2003; not funded

Apoptosis and Cellular Immunity in BVDV and BRSV Co-Infections

Kelling CL, AR Woolums, BW Brodersen, S Srikumaran and RO Donis. 2002. USDA NRIG; $346,944

Assessment of the Health and Reproductive Status of River Otters in Nebraska

MP Carlson. Helped establish toxicological aspects of the NE Game and Parks Commission research project. Contract for services provided by Veterinary Diagnostic Center faculty and staff, $12,500

***Brachyspira-Helicobacter* in Inflammatory Bowel Disease**

GE Duhamel. 2003. National Institute of Allergy and Infectious Diseases Grant Program, NIH, pending, $138,700

Characterization of Pathogenicity of Rotavirus WC3 Reassortant in Gnotobiotic Calves

Kelling CL, DJ Steffen and GE Duhamel. 2003, $309,448

Competitive Exclusion as an *E. coli* O157:H7 Intervention Strategy Phase II

Klopfenstein TJ, Smith DR, Moxley RA, Erickson and Hinkley S. Nutrition Physiology Corp., 05-2003/12-2003; $50,000

Efficacy of CamasEye-O157™ in Controlling *E. coli* O157:H7 in Feedlot Cattle

Klopfenstein T, D Smith, G Erickson and R Moxley. Not funded; $34,400

Farnesol and Biofilm in a Mouse Model of Candida Infection

KW Nickerson and GE Duhamel. 2003. National Institute of Allergy and Infectious Diseases Grant Program, NIH, not funded, $141,166

Functional Analysis of the HSV-1 Gene Encoding LAT
CJ Jones. NIH

***Helicobacter*-Associated Colitis of *Callithricidae* Kept in Zoo Exhibits**
GE Duhamel. 2003. Wildlife/Special Species - Infectious Diseases/Immunology, Morris Animal Foundation, pending, $33,512

Induction of Protective Immunity in Calves Against BRSV Infection Using Plasmid DNA Vaccines
Kelling CL. Schering-Plough, $37,700

Influence of Enterotoxins on Colonization of Intestines by Pathogenic Bacteria
Francis DH and RA Moxley. USDA/CSREES, National Research Initiative Competitive Grants Program; not funded; $230,000

Intervention Strategies to Reduce *Escherichia coli* O157:H7 in Beef Feedyards
D Smith, G Erickson, R Moxley, T Klopfenstein and S Hinkley. USDA Integrated Research, Education and Extension Competitive Grants Program, NIFSI. 10-2003/10-2006; $500,00

JDIP: Johne's Integrated Program in Research, Education and Extension
V Kapur et al. National Research Initiative Integrated Program. UNL-Subcontract, pending; 01-01-04/12-31-05; $4.0 Million

MHC Class I Down-Regulation by Bovine Herpesvirus 1: Viral Proteins Involved, and Underlying Mechanisms
S. Srikumaran. USDA/NRICGP; 09-03/08-06; $288,895

Molecular Analysis of a Mycobacterium Paratuberculosis Colony-Morphology Attenuated Mutant
RG Barletta and CJ Czuprynski (University of Wisconsin-Madison). USDA, National Research Initiative Competitive Grant Program (Sustaining Animal Health and Well Being); pending; 12-01-03/11-30-05; $298,864

Molecular Characterization and Pathogenesis of *Francisella tularensis*
SH Hinrichs, Provisional PI-UNMC; M Meagher, Provisional PI-UNL; GE Duhamel, seven other faculty at UNL and UNMC. 2003. University of Nebraska-Lincoln and University of Nebraska Medical Center Research Collaboration Grant Program, $100,000

Molecular Analysis of a Mycobacterium Paratuberculosis Colony-Morphology Attenuated Mutant
RG Barletta and CJ Czuprynski (University of Wisconsin-Madison). USDA, National Research Initiative Competitive Grant Program (Sustaining Animal Health and Well Being); pending; 12-01-03/11-30-05; $298,864

Multidisciplinary Educational Program in Livestock Enteric Bacterial Diseases and Food Safety

GE Duhamel. 2003. USDA, Higher Education Challenge Grants Program, not funded, $250,000

Multidisciplinary Educational Program in Livestock Enteric Bacterial Diseases and Food Safety

GE Duhamel and RA Moxley. USDA/CSREES, Integrated Research, Education and Extension Competitive Grants Program — National Integrated Food Safety Initiative; not funded; $247,738

Mycobacterial Entry Mechanisms

Jeffrey D. Cirillo; NIH/NIAID; 10-01-04/09-31-09; $1,440,000

Mycobacterium Avium subsp. Paratuberculosis Intestinal Invasion

LE Bermudez, RG Barletta. USDA National Research Initiative Competitive Grants Program; (requested UNL subcontract); not funded, 09-01-03/08-31-05; $115,775

NIH Supplement to NCV

Charles Wood and CJ Jones. Submitted January 2003; $500,000

Polymicrobial Associations in Inflammatory Bowel Disease

GE Duhamel. 2003. National Institute of Allergy and Infectious Diseases Grant program, NIH, pending, $138,700

Production and Characterization of Group A Bovine Rotavirus Challenge Material in Gnotobiotic Calves

GE Duhamel. 2003. Novartis Animal Vaccines, Inc., $13,854

Proteomic Vaccine Technology for Intracellular Pathogens

JA Williams and GE Duhamel. 2003. Small Business Innovative Research, Biodefense Program, NIH, not funded, $573,307

Pulmonary Immune Responses to *Francisella tularensis*

T Jerrells and GE Duhamel. 2003. National Institute of Allergy and Infectious Diseases Grant Program, NIH, not funded, $2,110,601

Redox Signaling in the Lens

Marjorie Lou. National Institute of Health; 07-01-03/06-30-08; pending; $1,486,250

Region VII Research Center of Excellence

SH Hinrichs and GE Duhamel, co-PI along with 27 investigators at 6 universities, 1 institute and 1 industry partner. 2003. Regional Centers of Excellence for Biodefense and Emerging Infectious Disease Research Program, NIH, not funded, $26,239,100

Region VII Research Center of Excellence

S Hinrichs et al. NIH, Program for Regional Centers of Excellence for Biodefense and Emerging Infectious Diseases Research, Developmetal Therapeutics Project Subcontract (M Griep, R Barletta and J Takacs), not funded; 8-01-03/7-31-08; $2,861,783

Regulation of the Latency-Reactivation Cycle by the Bovine Herpesvirus 1 (BHV-1) Latency Related Gene

CJ Jones. USDA, National Research Initiative Competitive Grants Program, 11-01-2003/10-30-2006, submitted in December 2002

Role of Nonstructural Proteins in Pestivirus Virion Assembly

RO Donis. NIH; $1,160,000

Role of Invasion Genes in Virulence of *Legionella*

Jeffrey D. Cirillo; NIH/NIAID; 04-01-04/03-31-09; $1,450,000

Safety Testing of Rotavirus Vaccine in Gnotobiotic Calves

CL Kelling and GE Duhamel. 2003. Merck & Co., Inc., $134,784

Signal Transduction by *Legionella* in Macrophages

Jeffrey D. Cirillo; NIH/NIAID; 07-01-04/06-30-09; $1,262,925

The Development of Therapeutic Agents to Enhance Biosecurity

Takacs J, Barletta R, Benson A, Cirillo J, Griep M, Powers R, Hinrichs S, Fey P, Iwen P, Jerrells T. Nebraska Research Initiative, pending ; 07-01-04/06-30-05; $506,900

The HSV-1 LAT Gene Regulates Interferon Expression

CJ Jones. NIH

Vaccination as an *E. coli* O157:H7 Intervention Strategy - Phase II

Klopfenstein TJ, Smith DR, Moxley RA, Erickson and Hinkley S. Nebraska Beef Council; 01-2003/09-2003; $50,000

Virulence Mechanisms of *Francisella tularensis*

JD Cirillo and GE Duhamel. 2003. National Institute of Allergy and Infectious Diseases Grant Program, NIH, not funded, $1,631,250

Vitamin-Dependent Modifications of Histones

J Zempleni, MF Lou, G Sarath and JS Stanley. 2003. National Institute of Health (4 yrs); $1,120,731

Chronic Wasting Disease Surveillance in Deer

DJ Steffen. Nebraska Game and Parks Commission, 2003 Estimated 5,000 samples. Status funded beginning November 17th, 2003; Estimated contract value, FY04, $100,000

Title Bovine Congenital Defects Quality Assurance Research Program

DJ Steffen. National Association of Animal Breeders, Renewal requested board considering on-going, non-competitive renewal of funding, projected, $12,000/year

Molecular Characterization and Pathogenesis of *Francisella tularensis*

Jeffrey Cirillo, Steve Hinrichs, Raul Barletta, Andy Benson, Paul Fey, Peter Iwen, Mark Griep, Gerald Duhamel and Tom Jerrolls; UNMC-UNL Collaborations, 2003; $100,000

Evaluation of GABA-Like Compounds

Peter Kador and Marjorie F. Lou. Merck Company, 11-01-02/01-31-03; $272,282

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A Method to Detect the Presence of a Microorganism in a Group of Animals

Smith DR, LL Hungerford, RA Moxley, S Hinkley, T Klopfenstein and J Gray. US Patent Application filed Aug. 7, 2002, Application Serial #10/213,998, UNL File #3104.1 Provisional Application #60/310,706; filed August 7, 2001; pending

D-alanine Racemase Mutants of Mycobacteria and Uses Therefore

RG Barletta and O Chacon. Submitted December 18, 2002. US Patent Application Serial #10/323,351, pending

Gene for Mycobacterial Diaminopimelic Acid

WR Jacobs Jr and JD Cirillo 1994. US Patent Application, Serial #08/203,190

Identification of Novel Loci Involved in Entry by *Legionella pneumophila*

JD Cirillo. 2000. US Patent Application, Serial #09/628,871

Identification of Virulence Determinants

RG Barletta and NB Harris. Submitted January 11 2001, US Patent Application Serial #09/759,287, pending

Insertional Mutations in Mycobacteria

WR Jacobs Jr, BR Bloom, GV Kalpana and JD Cirillo 1992. US Patent Application, serial #07/806,706

Methods and Compositions for Protection Against Bovine Herpesvirus 1

S. Srikumaran and Navaratnam Manjula. Serial #09/705,603, filed November 3, 2000, pending

Mycobacterium Smegmatis Resistant to D-cycloserine

RG Barletta and Z Feng. Submitted December 17, 2002. US Patent Application Serial #60/434,200, pending

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An Economic Risk Assessment of the Management of Pregnant Feedlot Heifers in the USA
Buhman MJ, Hungerford LL and Smith DR. 2003. Prev Vet Med., 59(4):207-22, ARD Journal Series #13679

Bifunctional Constructs of Aspirin and Ibuprofen (NSAIDs) That Express Antibacterial and Alkylation Activity
R. Bartzatt, S.L.G. Cirillo, J.D. Cirillo and L. Donigan. 2003. Biotechnol. Appl. Biochem., 37:273-282, ARD Journal Series #13890

Bovine Viral Diarrhea Virus as a Surrogate Model of Hepatitis C Virus for the Evaluation of Antiviral Agents
Buckwold VE, BE Beer and RO Donis. 2003. Antiviral Res, 60:1-15, ARD Journal Series #14098

Cloning, Expression and Characterization of Human Lens Thioredoxin
Yegorova S, Liu A-M and Lou MF. 2003. Invest. Ophthalmol. Vis. Sci., 44:2363-2371, ARD Journal Series #14085

Colonic Spirochetosis of Colony-Raised Rhesus Macaques Associated with *Brachyspira* and *Helicobacter*
Duhamel GE, Stryker CJ, Lu G, Wong VJ and Tarara RP. 2003. Anaerobe 9:45-55, ARD Journal Series #13859

Detection of Bovine Viral Diarrhea Virus in Semen After Infection of Seronegative, Post Pubertal Bulls
M Daniel, MD Givens, AM Heath, KV Brock, BW Brodersen, RL Carson, DA Stringfellow. 2003. American Journal of Veterinary Research, 64:428-434, ARD Journal Series #14426

Development of an Enzyme Linked Immunosorbent Assay for Estimation of Buffalo Immunoglobulins using Anti Bovine Light Chain Monoclonal Antibodies
Dhinakar Raj G, S Ratnaprabha, K Matheswaran, M Deshpande, S Srikumaran, AM Nainar and K Nachimuthu. 2003. Buffalo Journal, 1:83-90, ARD Journal Series #14237

Diabetes Can Alter the Signal Transduction in the Lenses of Diabetic Rats and Humans
Zatechka DS, Kador PF and Lou MF. 2003. Diabetes, 52:1014-1022, ARD Journal Series #13146

Duration of Infection and Proportion of Pigs Persistently Infected with Porcine Reproductive and Respiratory Syndrome Virus (PRRSV)
Wills RW, Doster AR, Galeota JA, Sur JH and Osorio FA. 2003 Journal of Clinical Microbiology, 41(1):58-62, ARD Journal Series #13782

Gradual Development of the Interferon-Gamma and Antibody Responses of Swine to Porcine Reproductive and Respiratory Syndrome Virus

Meier WA, Galeota J, OsorioFA, Husmann RJ, Schnitzlein W and Zuckermann FA. 2003. Virology, 309(1):18-31, ARD Journal Series #14065

Identification of Herpes Simplex Virus Type 1 (HSV-1) Latency Associated Transcript (LAT) Sequences that Both Inhibit Apoptosis and Enhance the Spontaneous Reactivation Phenotype

Jin L, W Peng, G-C Perng, AB Nesburn, C Jones and SL Wechsler. 2003. J of Virology, 77:6556-6561, ARD Journal Series #13894

Incidence, Duration, and Prevalence of *Escherichia coli* O157:H7 Fecal Shedding by Feedlot Cattle During the Finishing Period

Khaitsa ML, Smith DR, Stoner JA, Parkhurst AM, Hinkley S, Klopfenstein TJ and Moxley RA. 2003. J Food Prot., 66(11):1972-1977, ARD Journal Series #13968

Infection of Cattle with a Bovine Herpesvirus 1 (BHV-1) Strain that Contains a Mutation in the Latency Related Gene Leads to Increased Apoptosis in Trigeminal Ganglia During the Transition from Acute Infection to Latency

Lovato L, M Inman, G Henderson, A Doster and C Jones. 2003. J of Virology, 77:4848-4857, ARD Journal Series #13750

Inhibition of TAP by Pseudorabies Virus is Independent of its VHS Activity

Ambagala APN, RS Gopinath and S Srikumaran. 2003. Virus Research, 96(1-2):37-48, ARD Journal Series #13920

Patterns of Cellular Gene Expression in Cells Infected with Cytopathic or Non-Cytopathic Bovine Viral Diarrhea Virus

Risatti GR, D Pomp and RO Donis. 2003. Animal Biotechnology, 14:31-49, ARD Journal Series #14146

Roles of *Mycobacterium smegmatis* D-alanine-Dalanine Ligase and D-Alanine Racemase in the Mechanisms of Action and Resistance to the Peptidoglycan Inhibitor D-Cycloserine

Feng Z, RG Barletta. 2003. Antimicrobial Agents and Chemotherapy, 47:283-291; ARD J. Series #13729

Stimulation of Bovine Herpesvirus 1 Productive Infection by the Adenovirus E1A Gene and the Cellular Transcription Factor E2F4

Geiser V and CJ Jones. 2003. J of General Virology, 84:929-938, ARD Journal Series #13956

T Cell Epitope Identification for Bovine Vaccines: an Epitope Mapping Method for BoLA-A11

De Groot AS, V Nene, NR Hegde, S Srikumaran, J Rayner and W Martin. 2003. International Journal for Parasitology, 33(5):641-653, ARD Journal Series #14077

The BHV-1 LR Gene's Ability to Restore the High Reactivation Phenotype to an HSV-1 LAT Null Mutant Appears to be Due to its Anti-Apoptosis Function

Mott K, N Osorio, L Jin, D Brick, J Naito, J Cooper, G Henderson, M Inman, C Jones, SL Wechsler and G-C Perng. 2003. Journal of General Virology, 84:2975-2985, ARD Journal Series #14040

The Envelope Glycoprotein E2 is a Determinant of Cell Culture Tropism in Ruminant Pestiviruses

Liang D, IF Sainz, IH Ansari, LH Gil, V Vassilev and RO Donis. 2003. J Gen Virol, 84:1269-74, ARD Journal Series #13985

The Gene that Encodes the Herpes Simplex Virus Type 1 (HSV 1) Latency Associated Transcript (LAT) Influences the Accumulation of the Transcripts (Bcl-xL and Bcl-xS), that Encode Apoptotic Regulatory Proteins

Peng W, G Henderson, G-C Perng, AB Nesburn, SL Wechsler and CJ Jones. 2003. J of Virology, 77:10714-10718, ARD Journal Series #14218

The Possible Physiological Function of Thioltransferase in Cells

Xing K. and Lou MF. 2003. FASEB J. express article 10.1096, published online September 4, ARD Journal Series #14082

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A Novel Diagnostic Strategy to Classify Feedlot Pens by the Percentage of Cattle Shedding *Escherichia coli* O157:H7

Smith D, Gray J, Moxley R, Younts S, Blackford M, Hinkley S, Hungerford L, Milton C, Klopfenstein T. 2004. Epidemiology and Infection, in press, ARD Journal Series #13537

A Diagnostic Strategy to Determine the Shigatoxin Producing *Escherichia coli* O157 Status of Pens of Feedlot Cattle

DR Smith, JT Gray, RA Moxley, SM Younts, MP Blackford, S Hinkley, LL Hungerford, CT Milton and TJ Klopfenstein. 2004. Epidem Infect., in press, ARD Journal Series #13537

B-cell Epitopes in the Immunodominant p-34 Antigen of Mycobacterium Avium subsp. Paratuberculosis

Ostrowski M, S Mundo, NB Harris, RG Barletta and OJ Lopez. 2003. Scandinavian Journal of Immunology; in press; ARD J. Series #14093

Bifunctional Constructs of Aspirin and Ibuprofen (NSAIDs) That Express Antibacterial and Alkylation Activity

R. Bartzatt, S.L.G. Cirillo, J.D. Cirillo and L. Donigan 2003. Biotechnol. Appl. Biochem., 37:273-282, ARD Journal Series #13890

Biochemical Properties of Membrane-Associated Proteases of *Brachyspira pilosicoli* Isolated from Humans with Intestinal Disorders

Dassanayake RP, Caceres NE, Sarath G and Duhamel GE. 2003. Journal of Medical Microbiology, ARD Journal Series #13542

Cloning and Initial Characterization of an Alternatively Spliced Transcript Encoded by the Bovine Herpes virus 1 Latency Related (LR) Gene

Devireddy L, Y Zhang and CJ Jones. Journal of Neurovirology, in press, ARD Journal Series #14219

Colonic Spirochetosis of North American Opossums (*Didelphis virginiana*)

Duhamel GE, Ganley L, Barr BC, Whipple JP, Nordhausen RW, Walker RL and VanKruiningen HJ. Journal of Medical Microbiology, ARD Journal Series #14368

Decreased Shedding of *Escherichia coli* O157:H7 by Cattle Following Vaccination with Type III Secreted Proteins

Potter A, Klashinsky S, Li Y, Frey E, Townsend H, Rogan D, Erickson G, Hinkley, S., Klopfenstein T. 2004. Vaccine, 22:3-4, ARD Journal Series #13929

Evolution of Bovine Viral Diarrhea Virus Vaccines

Kelling CL. 2003. Veterinary Clinics of North America, Food Animal Practice, in press; ARD Journal Series #14144

Genome Diversity Among *Francisella tularensis* Subspecies *tularensis* and *Francisella tularensis* Subspecies *holartica* in North America

Samrakandi MM, Zhang C, Zhang M, Nietfeldt J, Duhamel GE, Olson ME, Fey PD, Iwen PC, Hinrichs SH, Cirillo JD and Benson AK. 2003. Journal of Bacteriology, ARD Journal Series #pending

Identification of Three Clusters of Canine Intestinal Spirochaetes by Biochemical and 16S rDNA Sequence Analysis

Johansson KE, Duhamel GE, Bergsjö B, Engvall EO, Persson M, Pettersson B and Fellström C. 2003. Journal of Medical Microbiology, ARD Journal Series #14262

Ileocolitis Associated with *Anaerobiospirillum* in Cats

De Cock HEV, Marks SL, Stacy BA, Zabka T, Burkitt J, Lu G, Steffen DJ and Duhamel GE. 2003. Journal of Clinical Microbiology, ARD Journal Series #14193

Immune Response of Pigs Inoculated with *Mycobacterium bovis* BCG Expressing a Truncated Form of GP5 and M Protein of Porcine Reproductive and Respiratory Syndrome Virus

Bastos RG, Dellagostini OA, Barletta RG, Doster AR, Nelson E, Zuckermann F and Osorio FA. 2003. Vaccine, in press, ARD Journal Series #14064

Immunohistochemistry Used as a Screening Method for Persistent Bovine Viral Diarrhea Virus Infection

Brodersen BW. 2003. Veterinary Clinics of North America, Food Animal Practice, ARD Journal Series #14152

Mucin Biosynthesis: C2GnT-M Gene, Tissue-Specific Expression and Bovine Herpesvirus –4 Homologue

Choi KH, Osorio FA and Cheng PW. 2003. American Journal of Respiratory Cell and Molecular Biology, in press, ARD Journal Series #14248

Peptide Transport Activity of Transporter Associated with Antigen Processing (TAP) is Inhibited by an Early Protein of Equine Herpes Virus-1 (EHV-1)

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Roles of Mycobacterium Smegmatis D-alanine-Dalanine ligase and D-alanine Racemase in the Mechanisms of Action and Resistance to the Peptidoglycan Inhibitor D-cycloserine

Feng Z and RG Barletta. 2003. Antimicrobial Agents and Chemotherapy, 47:283-291; ARD J. Series #13729

The Latency Related (LR) Gene Encoded by Bovine Herpesvirus 1 (BHV-1) can Suppress Caspase 3 and Caspase 9 Cleavage During Productive Infection

Henderson G, G-C Perng, AB Nesburn, SL Wechsler and CJ Jones. J. of Neurovirology, in press, ARD Journal Series #13829

The Bovine Herpesvirus 1 Latency Gene Stimulates Growth and Pathogenesis in Tonsils of Acutely Infected Calves

Perez S, M Inman, A Doster, C Jones. Submitted to the Journal of Virology, ARD Journal Series #14315

Thioltransferase as an Ascorbate Recycling Enzyme in Human Lens Epithelial Cells

Fernanda R, Makoto A., Monnior V and Lou MF. Invest. Ophthalmol. Vis. Sci., in press, ARD Journal Series #14083

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D. Ridenour, F. Sheng, L. Sylvia and J.D. Cirillo. 2003. Infect. Immun., in press; ARD Journal Series #13413

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Association of Oxidative Stress with Cataractogenesis

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Thoen CO and RG Barletta. Expected publication date, 2004. Iowa State University Press, in press

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The Epidemiology of *Escherichia coli* O157:H7

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●NON-REFEREED PUBLICATIONS AND RESEARCH REPORTS IN 2003●

Attachment of *Brachyspira pilosicoli* to cultured intestinal epithelial cell lines

Kolappaswamy K, Zhou YJ and Duhamel GE. 2003. 34th Midwest Student Biomedical Research Forum, Omaha, Nebraska, February 21-22, P-14 Poster

Beef Quality Assurance – Applications to Veterinary Technicians

DD Griffin. September 2003. American Association of Bovine Practitioners

Biochemical properties of membrane-associated proteases of *Brachyspira pilosicoli* isolated from humans with intestinal disorders

Dassanayake RP, Caceres NE, Sarath G and Duhamel GE. 2003. 2nd International Conference on Colonic Spirochaetal Infections in Animals and Humans, Edinburgh, United Kingdom, April 2-4, p. 37

Characterization of canine *Brachyspira* by cellular fatty acid analysis and pulse-field gel electrophoresis

Duhamel GE , Fellström C, Stryker CJ, Alexander M, Gunnarsson and Osterhout G. 2003. 2nd International Conference on Colonic Spirochaetal Infections in Animals and Humans, Edinburgh, United Kingdom, April 2-4, p. 34

Characterization of monoclonal antibodies specific for linear B-cell epitopes located within bovine group A rotavirus VP5*

Rice MA, Fang Y, Ambagala APW, Ambagala TC, Srikumaran S, Nelson EA and Duhamel GE. 2003. 84th Annual Meeting Conference Research Workers in Animal Diseases, St. Louis, Missouri, November 9-11, Poster

Colonic spirochetosis of colony-raised rhesus macaques is a polymicrobial disease associated with multiple species of *Brachyspira* and *Helicobacter*

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Duhamel GE, Ganley L, Barr BC, Whipple JP, Nordhausen RW, Walker RL and Van Kruiningen HJ. 2003. 2nd International Conference on Colonic Spirochaetal Infections in Animals and Humans, Edinburgh, United Kingdom, April 2-4, p. 42

Comparative pattern of spirochetal colonization in naturally-occurring swine dysentery and porcine colonic spirochetosis

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Comparative analysis of pathogenic and commensal porcine *Brachyspira* species membrane proteins

Zhang R and Duhamel GE. 2003. 2nd International Conference on Colonic Spirochaetal Infections in Animals and Humans, Edinburgh, United Kingdom, April 2-4, p. 46

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Duhamel GE, Stryker, CJ and Zhou YJ. 2003. 2nd International Conference on Colonic Spirochaetal Infections in Animals and Humans, Edinburgh, United Kingdom, April 2-4, p. 20

Detection of bovine viral diarrhea virus in testicular biopsies obtained after vaccination and inoculation of seronegative prepuberal bulls

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Duhamel GE. 2003. 2nd International Conference on Colonic Spirochaetal Infections in Animals and Humans, Edinburgh, United Kingdom, April 2-4, p.13

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Evasion of lysosomal fusion by *Brachyspira pilosicoli*-containing vacuoles, a novel mechanism of spirochete host macrophage interaction

Dassanayake RP, Zhou YJ, Cirillo JD and Duhamel GE. 2003. 34th Midwest Student Biomedical Research Forum, Omaha, Nebraska, February 21-22, P-4 Poster

Farnesol as a virulence factor in a mouse model of systemic candidiasis

Navarathna DHMLP, Hornby JM, Duhamel GE and Nickerson KW. 2nd Annual Meeting of the University of Nebraska-Lincoln, Microbiology Initiative, Beadle Center, Lincoln, Nebraska, August 19, Poster

Field Microbiology and Necropsy Techniques

DD Griffin. September 2003. American Association of Bovine Practitioners

Identification of penicillin-binding proteins (PBPs) in membrane extracts of *Brachyspira pilosicoli*

Dassanayake RP, Sarath G and Duhamel GE. 2003. 84th Annual Meeting Conference Research Workers in Animal Diseases, St. Louis, Missouri, November 9-11, Poster

Intervention strategies for reduction of *E. coli* O157:H7 in feedlot steers

Folmer J, Macken C, Moxley R. Smith D. Brashears M, Hinkley S, Erickson G and Klopfenstein T. 2003. 2003. Nebraska Beef Report, MP 80, pgs 22-23

Intervention strategies for reduction of *E. coli* O157:H7 in feedlot steers

Folmer J, C Macken, R Moxley, D Smith, M Brashears, S Hinkley, G Erickson and T Klopfenstein. 2003. 2003 Nebraska Beef Report. Agricultural Research Division, University of Nebraska Cooperative Extension, Institute of Agriculture and Natural Resources, University of Nebraska-Lincoln, pp. 22-23, http://animalscience.unl.edu/beef/beef.htm

Kinetics of Immune Response Against PRRSV

Osorio FA. 2003. Proceedings of the SEPOR 2003, International Symposium of Pig Production, September 15-18, pp. 77-84, Lorca , Murcia, Spain

Marketing Production Management Services to Beef Producers

GP Rupp. 2003. Proceedings of Oklahoma Veterinary Medical Association

Molecular Infection Biology: Interactions Between Microorgaanisms and Cells

J.D. Cirillo 2003. Invited Book Review; by J. Hacker and J. Heesemann., Quart. Rev. Biol., 78:223-224

Necropsy Technique

DD Griffin. September 2003. American Association of Bovine Practitioners

Phenotypic and genotypic characterization of *Brachyspira pilosicoli* isolated from humans with intestinal disorders

Duhamel GE and Tarasiuk K. 2003. 2nd International Conference on Colonic Spirochaetal Infections in Animals and Humans, Edinburgh, United Kingdom, April 2-4, p. 27

Phylogeny of canine intestinal spirochetes based on 16S rDNA analysis

Johansson KE, Duhamel GE, Bergsjö B, Olsson EE, Persson M, Pettersson B and Fellström C. 2003. 2nd International Conference on Colonic Spirochaetal Infections in Animals and Humans, Edinburgh, United Kingdom, April 2-4, p. 33

Porcine colonic spirochetosis caused by *Brachyspira pilosicoli*

Gwyn CB and Duhamel GE. 2003. Swine Health Symposium, Stratford, Ontario, Canada, May 16-18, pgs. 5-12

Prevalence of *Brachyspira hyodysenteriae* and *B. pilosicoli* infections among spanish swine herds with diarrhoea

Carvajal A, De Arriba ML, Rodriguez H, Vidal AB, Duhamel GE and Rubio P. 2003. 2nd International Conference on Colonic Spirochaetal Infections in Animals and Humans, Edinburgh, United Kingdom, April 2-4, p. 43

Vaccination Against Aujeszky's Disease: Compatibility with Diagnostics and with Eradication Efforts

Osorio FA. 2003. Proceedings XXVIII National Congress of AMVEC (Mexican Association of Swine Veterinarians), Guadalajara, Jalisco, Mexico, pp 82-89

Vaccine Studies Against Reproductive PRRS

Osorio FA. 2003. Proceedings of the SEPOR 2003, International Symposium of Pig Production, pp 113-124, September 15-18, Lorca , Murcia, Spain

● EXTENSION PUBLICATIONS IN 2003 ●

Aflatoxin M1 in Milk

Carlson MP, Ensley SM, Grant RJ and Smith DR. Nebraska Cooperative Extension, NebFact NF02-564

Biosecurity Handouts for Veterinarians and Livestock Producers

GP Rupp. 2003. "Getting Started with Biosecurity;" "Biosecurity in Practice Series: Dairy Herds, Replacement Heifers, Beef Breeding Herds, Beef Feedlots, and Sheep Flocks"

Feedlot Round Table

DD Griffin. 2003. February 2003, Grand Island

Fumonisins in Corn

Stack Jim and Michael P Carlson. March 2003, NebFact NF03-570

Guidelines for the Prudent Use of Antibiotics in Food Animals

Irwin K, Smith DR, Ebako GM, Ensley S, Griffin DD and Wohlers A.. Nebraska Cooperative Extension, NebGuide G03-1485-A

Prudent Use of Antibiotics in Companion Animals

Irwin K, Smith DR, Ebako GM, Ensley S, Griffin DD and Wohlers A. 2003. Nebraska Cooperative Extension, NebGuide G03-1501-A

Sampling and Analyzing Feed for Fungal (Mold) Toxins (Mycotoxins)

Carlson Michael P and Steve M Ensley. June 2003. NebGuide G03-1515-A

Understanding Fungal (Mold) Toxins (Mycotoxins)

Carlson Michael P and Steve M Ensley. June 2003. NebGuide G03-1513-A

Use of Feed Contaminated with Fungal (Mold) Toxins (Mycotoxins)

Carlson Michael P and Steve M Ensley. June 2003. NebGuide G03-1514-A

●COMPUTER SOFTWARE, OTHER PUBLICATIONS OR MEDIA DEVELOPED IN 2003●

■BW Brodersen

- •List owner for NEBVET-L
- •List owner for NEB SWINEVETS

■DD Griffin

- •Educational Aides and Materials Developed
- •Biosecurity Development Template CD - revised
- •Improving the safety of subcutaneous injections in cattle. Video, funded by Nebraska Cattlemen's Association
- •The "4 S's of Safety, funded by Elanco. Inc.

■GP Rupp

- •Farm and Ranch Biosecurity - Compact Disc
- •CowCalf5 - Further updates and program enhancements

● PRESENTATIONS BY VBMS FACULTY ●

National and International

An Early Protein of Equine Herpes Virus-1 Inhibits Peptide Transport Activity of TAP in Infected Cells

Ambagala APN, Gopinath RS and S Srikumaran. 2003. 27th International Herpesvirus Workshop, University of Wisconsin, Madison, WI, July 26-31, Abstract

Beef Quality Assurance

Griffin DD. 2003. National Cattlemen's Association. Kansas City, MO

Biosecurity – Clinical Forum for Veterinarians

Griffin DD. 2003. American Association of Bovine Practitioners. Columbus, OH

Beef Cattle Production Management

Griffin DD. 2003. South West Iowa Veterinary Medical Association

Beef Cattle Production Management

Griffin DD. 2003. Land-O-Lake Seminar, US-MARC, Clay Center, NE

Beef Feedlot Production Management and Quality Assurance

Griffin DD. 2003. Alberta Cattlemen's Association. Banff, Alberta

Beef Quality Assurance – Train the Trainer

DD Griffin. 2003. Eleven sessions across Nebraska; Nebraska Cattlemen's; January-November

Beef Quality Assurance – Veterinarian's Role

Griffin DD. 2003. Oklahoma Veterinary Medical Association

Beef Cattle Production Management

Griffin DD. 2003. Wisconsin Cattlemen's Association

Beef Quality Assurance

Griffin DD. 2003. Wisconsin Cattlemen's Association

Beef Herd Health and Calving Management

GP Rupp. 2003. Area Extension Meeting - Minden, NE

Beef Quality Assurance

Griffin DD. 2003. Louisiana Cattlemen's Association

Biosecure Systems to Prevent Neonatal Calf Diarrhea

Smith DR, Knott T and Grotelueschen DM. Jan 15, 2003. Winter meeting of the Nebraska Veterinary Medical Association, Omaha, NE

Biosecurity, What is it? Why now?

Smith DR. December 12-13, 2002. Nebraska, Kansas and Iowa; Biosecurity Conference, Council Bluffs IA

Biosecurity of Calf Scours

Smith DR. February 23, 2003. Burwell Veterinary Hospital, Burwell, NE

Effects of Testicular and Seminal Changes on Fertility of Yearling Beef Bulls

RW Ellis, GP Rupp, PJ Chenoweth, LV Cundiff and DD Lunstra. 2003. Society of Theriogenology, American College of Theriogenologists Annual Conference, Columbus, Ohio

Efficacy of Vaccination and Competitive Exclusion for Reducing *E. coli* O157:H7 in Feedlot Cattle

Moxley RA. 2003. Second Governor's Conference on Ensuring Meat Safety: *E. coli* O157:H7 - Progress and Challenges, April 7-8, Lincoln, Nebraska

Emerging Animal Diseases

Smith DR. November 22, 2002. 2002 Agricultural Forum; United Nebraska Bank, Kearney, NE

Enzootic Diseases of Importance in Nebraska's Wildlife. Nebraska Meat Safety Program

Doster AR. September 15, 2003, University of Nebraska-Lincoln, Lincoln, NE

***Escherichia coli* O157:H7 in Feedlot Cattle: So, What Do We Do Now?**

Smith DR. November 9, 2002. Cornhusker Beef Council Meeting; Cornhusker Hotel, Lincoln, NE

Feedlot Epidemiology of *E. coli* O157:H7: Bridging the Gaps

Smith DR. April 7-8, 2003. Second Governor's Conference on *Escherichia coli*, Lincoln, NE

Field Investigation of an Abortion Storm in a Dairy

Smith DR. 2003. UNL Veterinary Roundtable, Lincoln, NE, September 5, 2003

Functional Analysis of the HSV-1 LAT

CJ Jones. International Herpesvirus Workshop, July 2003, Madison, WI

Genetic Analysis of Pestivirus Assembly

Donis RO. September 19, 2003. Presented at the Dept of Microbiology and Immunology Seminar, University of Colorado Health Sciences Center

Genetic Analysis of Pestiviruses Using Full-Length Genomes and Subgenomic Replicons

Donis RO. Presented May 12, 2003. Antiviral Research, ICN Pharmaceuticals, Costa Mesa, CA

GP96 as an Adjuvant for theInduction of Cytotoxic T-lymphocyte (CTLs) Specific for Bovine Herpesvirus 1 (BHV-1)

Gopinath RS, TC Ambagala, APN Ambagala and S Srikumaran. 2003. 27th International Herpesvirus Workshop, July 26-31, University of Wisconsin, Madison, WI, Abstract

Hazard Analysis Critical Control Points (HACCP)

Griffin DD. 2003. Pre-Harvest Applications in Safe Livestock Production. Mexico City, Mexico

Identification of Novel Loci Involved in Entry by *Mycobacterium marinum* Into Host Cells

S.H. El-Etr, J.D. Cirillo (2003). *Gordon Res. Conf.* 2003, Molecular Mechanisms of Microbial Adhesion

***In vitro* Analysis and Immunization of BALB/C Mice with Plasmid DNA Encoding the G Glycoprotein of Bovine Respiratory Syncytial Virus**

Brady RP, CL Topliff and CL Kelling. 2003. The Nebraska Academy of Sciences

Induction of Cytotoxic T-Lymphocytes Specific for Bovine Herpesvirus 1: Effect of gp96 as an Adjuvant

Gopinath RS, TC Ambagala, APN Ambagala and S Srikumaran. 2003. Viral Vaccines, The International Human & Animal Viral Vaccination Conference, Royal College of Physicians of Edinburgh, Edinburgh, UK, Abstract, July 14-16

International Herpesvirus Workshop

CJ Jones. July 2003, Madioson, WI. Co-author on 4 other posters and presentations

Kansas Biosecurity Seminar for Veterinarians

GP Rupp. 2003. Manhattan and Hays, Kansas

L-Alanine Dehydrogenase (Ald) of Mycobacteria: Physiological Role in Alanine Metabolism and Latency

RG Barletta. Invited presentation, University of Nebraska Redox Biology Center, Lincoln, Nebraska, April 18, 2003

Livestock Biosecurity, Challenges and Opportunities

Smith DR. March 5, 2003. 15th Annual Governor's Conference on Agriculture, Kearney, NE

Marked Physical Changes Occur in Yearling Beef Bulls During Natural Breeding

RW Ellis, GP Rupp, PJ Chenoweth, LV Cundiff and DD Lunstra. 2003. American Society of Animal Science Annual Meeting

Marketing Production Management Practices

GP Rupp. 2003. Oklahoma Veterinary Medical Association - Annual Conference for Veterinarians, Oklahoma City, Oklahoma

Molecular Genetic Analysis of Mycobacterium avium subsp. paratuberculosis Intracellular Survival in Bovine Macrophages

RG Barletta. Invited presentation, Department of Microbiology, University of Guelph, Guelph, Canada, October 24, 2003

Nebraska Biosecurity Seminar for Veterinarians

GP Rupp. 2003. North Platte and York, Nebraska

Overview of the Veterinary Diagnostic Laboratory and Its Relationship to Veterinary Practice

Doster AR. Vatterot College Veterinary Technician Students, May 7, 2003, Lincoln, NE

Oxidative Damage and Repair in Protein Thiols of the Eye Lens

Lou MF. Minisymposium of the Redox Biology Center, the University of Nebraska-Lincoln, Lincoln, NE, September 12, 2003

Pestivirus Translational Efficiencies in Primate and Bovine Cell Lines

Topliff CL, SK Chon, RO Donis, KM Eskridge and CL Kelling. 2003. The Nebraska Academy of Sciences

Pestivirus-Host Interactions

Donis RO. March 21, 2003. Presented at the Department of Microbiology and Molecular biology, University of Guelph, Ontario, Canada

Phagocytic Cells and Intracellular Pathogens – Intimate Interactions

Cirillo, J.D. September 2003, Department of Biology, University of Nebraska, Omaha, NE

Porcine Colonic Spirochetosis Caused by *Brachyspira pilosicoli*

Gwyn CB and Duhamel GE. 2003. Swine Health Symposium, Stratford, Ontario, Canada, May 16-18, p. 5-12, Oral

Pre-Harvest Antibiotic Residue Testing

Griffin DD. 2003. Elanco University Workshop. Tallahassee, FL

Quantification of Viral mRNA in Cells Infected with Bovine Viral Diarrhea Virus and Bovine Respiratory Syncytial Virus

Achenbach JA,V Vassilev, CL Topliff, RO Donis and CL Kelling. 2003. The Nebraska Academy of Sciences

Quantitation of Bovine Viral Diarrhea Virus in Semen of a Bull with Persistent Localized Testicular Infection

Baxley DW, Givens DM, Brock KV, Brodersen BW and Stringfellow DA. 4th Annual Merck

Merial Veterinary Scholars Symposium, Kansas State University, Manhattan, KS, July 31-August 2, 2003

Reactive Oxygen Species Mediated PDGF Stimulation on Human Lens Epithelial Cells in Special Interest Symposium on Growth Factor Signaling
Lou MF, Zhang W, Chen C-W and Zhou Y. Alicante, Spain, October 8-11, 2003

Redox Signaling in the Lens
Lou MF. National Eye Institute, Bethesda, MD, April 2, 2003

Redox Regulation in the Lens
Lou MF. Cataract Research Forum, UNMC, Omaha, NE, May 31, 2003

Respiratory Syncytial Virus on Syncytia Formation
Daniels HA, CG Elowsky, Y Zhou, CL Topliff, C L Kelling. 2003. The Nebraska Academy of Sciences

Role of Mycobacterium Smegmatis L-Alanine Dehydrogenase in Bacterial Physiology
RG Barletta. Invited presentation, Corporacion para Investigaciones Biologicas, Medellin, Colombia, January 25, 2003

Strategies to Reduce the Prevalence of *Escherichia coli* O157:H7 in Feedlot Cattle
Moxley RA. 2003. Presentation to Nebraska high school science and agriculture teachers as part of the Nebraska Agriculture in the Classroom Workshop, sponsored by ALEC Department, July 17, Lincoln, Nebraska

Syndromic Surveillance
Smith DR. December 3, 2002. Nebraska Bureau of Animal Industry Work Conference, Lincoln, NE

The Presence of Mitochondrial Thioltransferase (Grx2) and its Protective and Regenerative Roles of Ascorbic Acid in Human Lens Epitelial Cells
Fernando MR, Gladyshev VN, Lou MF. 2003. Invest. Ophthalmol. Vis. Sci. Abstract, May 2003

The Molecular Machinery of BVD Virus and its Significance in Pathogenesis
Donis RO. Presented April 25, 2003. Department of Veterinary Sciences, South Dakota State University, Brookings, SD

The Use of CIDR's for AI in Beef Heifers
GP Rupp. 2003. Farmer/Rancher College, Clay Center, Nebraska

The Physiological Function of Thioredoxin in the Human Lens Epithelial Cells
Yegorova S and MF Lou. Invest. Ophthalmol. Vis. Sci., Abstract, May 2003

The Possible Physiological Function Of Thioltransferase In The Cells
K-Y Xing, MF Lou. Invest. Ophthalmol. Vis. Sci., Abstract, May 2003

The Distribution of Transsulfuration Enzyme, Cystathionine- Beta-Synthase (CBS), in the Eye
C Persa, L Moon and MF Lou. Invest. Ophthalmol. Vis. Sci., Abstract, May 2003

The Transsulfuration Pathway in the Lens
MF Lou, Z Ma and C Persa. Invest. Ophthalmol. Vis. Sci., Abstract, May 2003

The Search for Johne's Disease in Nebraska
Smith DR. 2003. Nebraska Bureau of Animal Industry Work Conference, Lincoln, NE, September 30, 2003

The Expression Of Thioltransferase In The Cultured Pig Lenses Under Oxidative Stress
S Moon, MR Fernando and MF Lou. Invest. Ophthalmol. Vis. Sci., Abstract, May 2003

The Presence of an Endogenous Superoxide Anion-Generating System in HLE Cells
W Zhang and MF Lou. Invest. Ophthalmol. Vis. Sci. Abstract, May 2003

The Redox Signaling and the AP-1 Regulated Gene Expression of Thioltransferase in the Human Lens Epithelial Cell
Lou MF. Redox Biology Seminar Series, Lincoln, NE, February 14, 2003

The Physiological Function of Reactive Oxygen Species, the Redox Signaling, in the Lens Epithelial Cells
C-W Chen, J Zhou, K-Y Xing, MF Lou. Invest. Ophthalmol. Vis. Sci., Abstract, May 2003

The Nebraska Veterinary Diagnostic Center. Nebraska Chapter of the American Association for the Assessment of Laboratory Animal Care
Doster AR. September 9, 2003, Lincoln, NE

Third Annual Symposium in Virology
AK Pattnaik. 2003. Invited Symposium Speaker at the, University of Nebraska-Lincoln

Transsulfuration Pathway: a Potential New Oxidation Defense System in the Lens
Lou MF, Persa C, Pierce A and Ma Z. Abraham Spector International Symposium, Montauk, Long Island, NY, October 11-13, 2003

Virological Tests Used in the Veterinary Diagnostic Center and Their Significance
Doster AR. October 11, 2003, CASNR Day

West Nile Virus Infection in Reindeer (*Rangifer tarandus*)
Palmer MV, WC Stoffregen, DG Rogers et al. August 11-14, 2003. Abstracts, 52nd Annual Conference of the Wildlife Disease Association, Saskatoon, SK

Annual Meeting of the 2nd International Conference on Colonic Spirochaetal Infections in Animals and Humans, Edinburgh, United Kingdom, April 2-4, 2003

Biochemical Properties of Membrane-Associated Proteases of *Brachyspira pilosicoli* Isolated from Humans with Intestinal Disorders

Dassanayake RP, Caceres NE, Sarath G and Duhamel GE.; poster, p. 37

Characterization of Canine *Brachyspira* by Cellular Fatty Acid Analysis and Pulse-Field Gel Electrophoresis

Duhamel GE, Fellström C, Stryker CJ, Alexander M, Gunnarsson and Ostethout G.; p. 34, poster

Colonic Spirochetosis of North American Opossums (*Didelphis virginiana*): A Potential Reservoir of Infection for Humans and Animals

Duhamel GE, Ganley L, Barr BC, Whipple JP, Nordhausen RW, Walker RL and Van Kruiningen HJ., p. 42, poster

Comparative Analysis of Pathogenic and Commensal Porcine *Brachyspira* Species Membrane Proteins

Zhang R and Duhamel GE.; p. 46, poster

Comparative Pattern of Spirochetal Colonization in Naturally-Occurring Swine Dysentery and Porcine Colonic Spirochetosis

Duhamel GE, Jensen TK, Boye M and Møller K.; p. 48, poster

Demonstration of *Brachyspira pilosicoli* Association with Canine Colonic Spirochetosis and "*B. canis*" as a Non-Pathogenic Commensal

Duhamel GE, Stryker, CJ and Zhou YJ.; p. 20, oral presentation

Diagnostic Procedures for Colonic Spirochaetal Infections, Where Have We Been and Where Are We Going?

Duhamel GE.; p.13, oral presentation

Farnesol as a Virulence Factor in a Mouse Model of Systemic Candidiasis

Navarathna DHMLP, Hornby JM, Duhamel GE and Nickerson KW. 2nd Annual Meeting of the University of Nebraska-Lincoln, Microbiology Initiative, Beadle Center, Lincoln, Nebraska, August 19, Poster

Phenotypic and Genotypic Characterization of *Brachyspira pilosicoli* Isolated From Humans with Intestinal Disorders

Duhamel GE and Tarasiuk K. 2003. Oral presentation

Phylogeny of Canine Intestinal Spirochetes Based on 16S rDNA Analysis

Johansson KE, Duhamel GE, Bergsjö B, Olsson EE, Persson M, Pettersson B and Fellström C., p. 33, Poster

Prevalence of *Brachyspira hyodysenteriae* and *B. pilosicoli* Infections Among Spanish Swine Herds with Diarrhoea

Carvajal A, De Arriba ML, Rodriguez H, Vidal AB, Duhamel GE and Rubio P. p. 43, Poster

46th Annual Conference of the American Association of Veterinary Laboratory Diagnosticians (AAVLD), October 11-13, 2003, San Diego, California

A Commercial Kit of Real Time RT/PCR for the Rapid, Simple Detection of Porcine Reproductive and Respiratory Syndrome Virus in Swine Samples

JD Callahan, J Christopher-Hennings, TA Gay; ME Reos, Y Fang, M Dammen, A Wasilk, Galeota J, FA Osorio, M Torremorell, Wm M Nelson and E Nelson

Bovine Abortion/Stillbirth in Nebraska: Influence of Sampling and Sample Origin on Diagnostic Success

Corbellini LG, Steffen DJ, Doster AR, Rogers DG, Brodersen BW and Osorio A..

Diagnosis of Bovine Abortion/Stillbirth in Nebraska

Corbellini LG, Steffen DJ, Doster AR, Rogers DG, Brodersen BW and Osorio FA.

Fundamentals of Mendelian Inheritance and Teratology; Diagnostic Approaches to Congenital Disease; Emerging Syndromes of Current Concern; American Shorthorn Association Directors Meeting, July 16th, on Tibial Hemimelia and Genetic Disease Reporting and Control Programs

DJ Steffen. CL Davis Foundation, Sponsored Symposia on Reproductive Pathology: CD-ROM provided to participants

Investigation of *Moraxella ovis* Isolates Recovered from Cases of Infectious Bovine Keratoconjunctivitis

Cerny HE, DG Rogers and JT Gray et al. Abstracts

Protection by Prior Vaccination with Modified Live Virus (MLV) Bovine Viral Diarrhea Vaccine and Subsequent Exposure to Persistently Infected Calves

Fulton RW, Briggs RE, Ridpath JF, Saliki JT, Johnson BJ, Confer AW, Brodersen BW, Smith DR, Step DL, Sawyer J.

West Nile Virus Infection in Reindeer (*Rangifer tarandus*)

Palmer MV, WC Stoffregen, DG Rogers et al.

84th Annual Conference Research Workers in Animal Diseases (CRWAD), November 9-11, 2003, Chicago, IL

Amount of Shiga Toxin Type 2 (Stx2) Expressed by *Escherichia coli* O157:H7 Strains *in vitro* is Correlated with Virulence in the Gnotobiotic Piglet Model

Baker DR, RA Moxley and DH Francis. 2003. South Dakota State University, Department

of Veterinary Science, Brookings, SD. University of Nebraska-Lincoln, Department of Veterinary and Biomedical Science, Lincoln, Nebraska, Abstract 78, oral presentation, Food and Environmental Safety section

Characterization of Monoclonal Antibodies Specific for Linear B-cell Epitopes Located Within Bovine Group A Rotavirus VP5*

Rice MA, Fang Y, Ambagala APW, Ambagala TC, Srikumaran S, Nelson EA and Duhamel GE. Poster

Clinical Trials to Test the Effectiveness of Cleaning Pens, Feeding Competitive Bacteria, or Limiting Dietary Starch to Reduce Fecal Shedding of *E. coli* O157:H7 by Feedlot Cattle

Khaitsa ML, Smith DR, Moxley RA, Folmer JD, Hinkley S, Erickson GE, Klopfenstein TJ and Brashears M. Abstract 84

Colonic Spirochetosis of Colony-Raised Rhesus Macaques is a Polymicrobial Disease Associated with Multiple Species of *Brachyspira* and *Helicobacter*

Duhamel GE, Sestak K, Stryker CJ, Lu G and Lackner AA. Oral presentation

Detection and Quantification of Viral mRNA in Cells Infected with Bovine Viral Diarrhea or Bovine Respiratory Syncytial Virus using Quantitative Real-Time and Competitive RT-PCR Assays

Achenbach JE, CLTopliff, VVassilev, RO Donis, KM Eskridge and CL Kelling

Development of a Model for the Assessment of the Significance of *E. coli* Enterotoxins in the Pathogenesis of Porcine Colibacillosis

Zhang W, J Freeling, E Berberov, R Moxley and D Francis. 2003. Department of Veterinary Science, South Dakota State University, Brookings, SD; Department of Veterinary & Biomedical Science, University of Nebraska, Lincoln, Nebraska; Abstract 14, oral presentation, Bacterial Pathogenesis section

Effect of Cysteine Supplementation on Glutathione Deficient Natural Killer Cells Following Bovine Respiratory Syncytial Virus or Bovine Viral Diarrhea Virus Infection

Matulka LA, L Wilkie, C Kuszynski, DR Brink and CL Kelling.

***Escherichia coli* O157:H7: an Update on Intestinal Colonization and Virulence Mechanisms**

Moxley RA. Abstract 92, oral presentation, invited (keynote) address, Gastroenteric Diseases section

Identification of Penicillin-Binding Proteins (PBPs) in Membrane Extracts of *Brachyspira pilosicoli*

Dassanayake RP, Sarath G, Duhamel GE. Poster

Influence of N-Glycans on Cell Surface Transport of the Fusion Protein of Bovine Respiratory Syncytial Virus

Daniels HA, RP Brady, CL Topliff and CL Kelling.

Plasmid DNA Constructs Encoding the Attachmen (G) Glycoprotein of Bovine Respiratory Syncytial Virus: Expression and Induction of Antibody Response

Brady RP, CL Topliff and CL Kelling.

The Ecology of *Escherichia coli* O157:H7 and *Salmonella* spp. in Pens of Feedlot Cattle Over the Feeding Period of Different Seasons

Smith DR, Moxley RA, Folmer JD, Hinkley S, Hungerford LL, Khaitsa M, Erickson GE and Klopfenstein TJ.

Vaccination and Direct-Fed Microbials as Intervention Strategies to Reduce the Prevalence of *Escherichia coli* O157:H7 in Feedlot Cattle

R Moxley, D Smith, T Klopfenstein, J Folmer, C Macken, G Erickson, S Hinkley, A Potter and B Finlay. 2003. 84th Annual Meeting Conference of Research Workers in Animal Diseases, Chicago, IL

Annual Meeting of the Midwest Section American Society of Animal Science Proceedings (ASASP)

A Flow Cytometric Method for Intracellular Analysis of Glutathione Concentration of Bovine Natural Killer Cells

Matulka LA, L Wilkie, C Kuszynski, DR Brink and CL Kelling.

Intracellular Glutathione Concentration in Bovine Natural Killer Cells After Infection with Bovine Respiratory Syncytial Virus or Bovine Viral Diarrhea Virus

Matulka LA, L Wilkie, C Kuszynski, S Justice, D Wylie, KM Eskridge, DR Brink and CL Kelling

North Central Conference of Veterinary Laboratory Diagnosticians (NCCVLD), June 9-10, 2003, St. Paul, Minnesota

Bovine Abortion/Stillbirth in Nebraska: Influence of Sampling and Sample Origin on Diagnostic Success

Corbellini LG, DJ Steffen and DG Rogers. pp. 5

Diagnosis of Bovine Abortion/Stillbirth in Nebraska

Corbellini LG, DJ Steffen and DG Rogers. Abstracts

Enterotoxigenic *Escherichia coli* Infection in a Puppy

Hinkley S, D Rogers and H Cerny. Abstracts

Annual Convention of the 36th American Association of Bovine Practitioners (AABP), September 20, 2003, Columbus, Ohio

E-Mail Filters and Other Secrets For a Happy Life on AABP-L
Smith DR

Field Microbiology and Necropsy Techniques
Griffin DD

General Meeting of the 103rd American Society for Microbiology (ASM), May 18-22, 2003, Washington, DC

Generation and Screening of a Comprehensive Transposon Mutant Bank of Mycobacterium avium subsp. paratuberculosis
Barletta RG, NB Harris, X Liu, J Sotos, DK Zinniel, Z Feng, O Chacon and C J Czuprynski, Poster U-067

Transformation with Plasmid DNA of Endophytic Bacteria Isolated from Agronomic Crops and Prairie Plants
Vidaver AK, Zinniel DK, Feng Z and Barletta RG, Poster Q-384

Presentation at the Annual Meeting of the 5th International Symposium on "Shiga Toxin (Verocytotoxin)-producing *Escherichia coli* Infections." VTEC 2003, Edinburgh, Scotland, June 8-11, 2003

Pen Test Devices for Detection of *E. coli* O157 and Salmonella in Cattle
Fegan N, Higgs GM, Vanderlinde P, Desmarchelier P and Smith DR. Poster, VTEC 2003

The Ecology of *Escherichia coli* O157:H7 in Pens of Feedlot Cattle Over the Feeding Period of Different Seasons
D Smith, R Moxley, J Folmer, S Hinkley, G Erickson and T Klopfenstein. VTEC 2003, Abstract P55, poster presentation

Vaccination and Direct-Fed Microbials as Intervention Strategies to Reduce the Prevalence of *Escherichia coli* O157:H7 in Feedlot Cattle
R Moxley, D Smith, T Klopfenstein, J Folmer, C Macken, G Erickson, S Hinkley, A Potter and B Finlay; VTEC 2003

Vaccination and Feeding a Competetive Exclusion Product as Intervention Strategies to Reduce the Prevalence of *Escherichia coli* O157:H7 in Feedlot Cattle
Moxley R, Smith DR, Klopfenstein T, Erickson G, Folmer J, Macken C, Hinkley S, Potter A and Finlay B.; VTEC 2003

Vaccination and Direct-Fed Microbials as Intervention Strategies to Reduce the Prevalence of *Escherichia coli* O157:H7 in Feedlot Cattle

Moxley RA, DR Smith, TJ Klopfenstein, JD Folmer, CN Macken, GE Erickson, S Hinkley, AA Potter and BB Finlay. Dept. of Vet. & Biomed. Sci., Dept. of Animal Sci., U. of Nebraska, Lincoln, NE. Vaccine & Infectious Disease Org., U. of Saskatchewan, Saskatoon, Saskatchewan, Canada. Biotechnology Laboratory, U. of British Columbia, Vancouver, BC, Canada.; Abstract 0-13; oral and poster presentations; VTEC 2003

Annual Meeting of the 34th Midwest Student Biomedical Research Forum, Omaha, Nebraska, February 21-22, 2003

Attachment of *Brachyspira pilosicoli* to Cultured Intestinal Epithelial Cell Lines

Kolappaswamy K, Zhou YJ and Duhamel GE. P-14, Poster

Effect of Viral Infection on Intracellular Glutathione Concentration in Bovine Peripheral Blood Mononuclear Cells

Matulka LA, L Wilkie, C Kusznyski, S Justice, D Wylie, DR Brink and CL Kelling

Evaluation of Recombinant G Glycoproteins of Bovine Respiratory Syncytial Virus

Brady RP, CL Topliff, HA Daniels and CL Kelling

Evasion of Lysosomal Fusion by *Brachyspira pilosicoli*-Containing Vacuoles, a Aovel Mechanism of Spirochete Host Macrophage Interaction

Dassanayake RP, Zhou YJ, Cirillo JD and Duhamel GE. P-4, Poster

Influence of N-Glycans of the Fusion Protein of Bovine Respiratory Syncytial Virus on Expression in Mammalian Cells

Daniels HA, RP Brady, CLTopliff and CL Kelling

Quantification of Viral mRNA in Cells Infected with Bovine Viral Diarrhea Virus and Bovine Respiratory Syncytial Virus

Achenbach JA., V Vassilev, CL Topliff, RO Donis, CL Kelling

Translational Efficiencies of Bovine Viral Diarrhea Virus Genotype 2 Field Isolates Before and after site-directed mutagenesis of the 5'UTR IRES

Topliff CL, SK Chon, RO Donis, KM Eskridge and CL Kelling. 2003. 34th Ann Midwest Student Biomedical Research Forum

● OTHER PUBLICATIONS-PUBLIC PRESS, LAY JOURNALS, ETC. FOR 2003 ●

▸**BW Brodersen - Attack BVD Head-On** - BW Brodersen. 2002. Angus Journal, 24:5:132-134

▸**M.F. Lou - Media Release - Cataract Research at UNL** - A video on made by UNL Education TV televized nationally during UNL Football games, 2003

▸**F.A. Osorio - Diagnosis of Aujeszky's Disease** - Published in "Informativo Porcino," Vol. 5, No. 22, pp 26-29, Publ. Rotecna, Spain, 2003

Debating Aujeszky's Disease at the University of Leon - Published in "Ediporc," Barcelona , Spain, No. 60, pp 40

●SELECTED COMMITTEE, EDITORIAL AND OTHER APPOINTMENTS●

▸Barletta, Raúl G.

- •Radiation Safety Committee, University of Nebraska-Lincoln, March 2000-present
- •Safety Committee Chair, Department of Veterinary and Biomedical Sciences, September 1999-present
- •Book Chair, Department of Veterinary and Biomedical Sciences, September 1997-present
- •Adjunct Professor, Department of Veterinary Pathobiology, Texas A&M University, March 18, 1997-present
- •Adjunct Professor, School of Biological Sciences, September 17, 1997-present
- •Member, Comparative Pathobiology GREG, September 17, 1997-present
- •Member, Microbiology GREG, September 17, 1997-present
- •Member, Center for Redox Biology, University of Nebraska-Lincoln, 2002-present
- •Affiliate Member, Center for Biotechnology. University of Nebraska-Lincoln
- •Chair, Biomedical Sciences Group, LSIGRP (Life Sciences Interdisciplinary Graduate Recruitment Program), 1991-present
- •Reviewer, Journal of Clinical Microbiology
- •Reviewer, Antimicrobial Agents and Chemotherapy
- •Panel Member, Animal Health, Binational Agriculture and Development Fund (BARD), 2004

▸Brodersen, Bruce W.

- •Chairman, Veterinary School Student Selection Committee, 2003
- •Public Relations Committee, Nebraska Veterinary Medical Association, 2000-2003
- •Chair, George A. Young Swine Health and Management Conference, 2001-2003
  - ▸Responsible for annual submission of cases to the Armed Forces Institute of Pathology for participation in the Wednesday Slide Conference
  - ▸Responsible for maintaining and continued updating of the collection of histopathology slides from the Armed Forces Institute of Pathology, Washington, DC

▸Carlson, Michael P.

- •IANR Pesticide Advisory Committee, 1997 to present

▸Cirillo, Jeffrey D.

- •Editorial Board, *Frontiers in Bioscience*
- •Ad-hoc reviewer, Biotechnology & Biological Sciences Research Council, UK
- •Ad-hoc reviewer, USDA
- •Ad-hoc reviewer, AMFAR
- •Ad-hoc reviewer, NSF
- •Ad-hoc reviewer, Maryland Sea Grant Program
- •Ad-hoc reviewer, U.S.-Israel Binational Agricultural Research Dev. Fund (BARD)
- •Ad-hoc reviewer, Netherlands Organization for Scientific Research (NOW)
- •Panel Member, NIH, Special Emphasis Panel, "Ecology of Infectious Diseases"
- •Reviewer, *BMC Microbiology*

•Reviewer, *Biotechniques*
•Reviewer, *Environmental Microbiology*
•Reviewer, *Gene*
•Reviewer, *Infection and Immunity*
•Reviewer, *Journal of Clinical Microbiology*
•Reviewer, *Lancet*
•Reviewer, *Microbiology*
•Reviewer, *Molecular Microbiology*
•Reviewer, *Protein Science*
•Reviewer, *Quarterly Review of Biology*
•Reviewer, *Trends in Microbiology*
•Adjunct Assistant Professor, Department of Microbiology, University of Hawaii- Manoa. 1998-2000
•Member, Microbiology GREG; 1998-present
•VBMS Graduate Committee; 1999-2001
•Dinsdale Family Faculty Award Committee; 2001
•MSIA Graduate Committee; 2000-present
•ARD Hatch Project Review Committee, 2001
•UNL Honors Convocation Committee; 1999-present
•Supervisor of project to upgrade departmental webpage
•Member, UNL Office of Professional and Organizational Development Supervisory Committee; 1999-present
•Life Sciences Interdisciplinary Program Steering Committee, 2001
•Life Sciences Interdisciplinary Graduate Recruitment Program Executive Committee, 2001-present

▸Donis, Ruben O.

•NIH CSR Vaccines Study Section; member, 1999-present
•ASM/Natl Center Infectious Dis. (NCID) Postdoctoral Program Steering Committee, 1999-Present
•Ad-Hoc reviewer for J. Virology, J. Gen. Virology, Virology, Vaccine

▸Doster, Alan R.

•American Association of Veterinary Laboratory Diagnosticians: Histopathology Committee
•Review Committee, Journal of Swine Health and Production, Swine Diseases and Diagnostic Notes
•Ad Hoc Reviewer, Canadian Journal of Veterinary Research
•Ad Hoc Reviewer, Journal of Virological Methods
•Pseudorabies Advisory Committee: ex-official member
•Nebraska Veterinary Medical Association Disease Control and Legislative Committee
•Student Mentor, Nebraska Pork Producers Association

▸Duhamel, Gerald E.

•Director-at-Large, The Comparative Gastroenterology Society, 1997-2003
•*Ad Hoc* Reviewer, USDA, National Research Initiative, Animal Health and Well Being

Bacteriology Study Section
- Advisor, National Committee for Clinical Laboratory Standards (NCCLS) Veterinary Antimicrobial Susceptibility Testing (V-AST) Sub-committee
- Member (1996 - present), Bacteriology/Mycology Committee, Anaerobic Techniques Sub-committee
- American Association of Veterinary Laboratory Diagnosticians
- Member (1991 - present), Committee on Transmissible Diseases of Swine United States Animal Health Association
- Co-representative (1988 - present), NC-1007 Technical Committee on Enteric Diseases of Swine and Cattle: Prevention, Control and Food Safety, Nebraska Agriculture Experiment Station
- *Ad Hoc* Reviewer for Peer-reviewed Scientific Journals
  - Journal of Clinical Microbiology
  - Journal of Medical Microbiology
  - Microbiology
  - FEMS Microbiology Letters
  - Journal of Veterinary Diagnostic Investigation
- Chair, UNL Institutional Animal Care and Use Committee (2000 - present)
- Member, UNL Institutional Biosafety Committee (1995 - present)
- Member, IANR, Agricultural Research Division Advisory Council (2002 - 05)
- Panel Review Member, IANR (2002 - 05)
  - Layman Fund Research Program
  - Undergraduate Honors Student Research Program
- Advisory Committee Member, Center for Biotechnology, Microscopy Core Facility (2002 - present)
- Steering Committee Member, UNL Microbiology Initiative
- Member, Departmental Peer Review Committee (2002 - 05)
- Member, Departmental Research Strategic Plan
- Supervisor, Veterinary Basic Science Transmission Electron Microscopy Facility (2001 - present)
- Supervisor, Veterinary Basic Science Glassware Cleaning and Sterilization Facility (2001 - present)

D. D. Griffin

- National Cattlemen's Beef Association, Beef Quality and Safety Taskforce
- Academy of Veterinary Consultants, Chairman Standards of Practice Committee
- Reviewer for the American Journal of Veterinary Research
- Reviewer for the Journal of the American Veterinary Medical Association
- Reviewer for the American Association of Bovine Practitioner

Jones, Clinton J.

- Reviewed manuscripts for Journal of Virology (8), Journal of Neurovirology (3), and Journal of Clinical Microbiology (3), Cell Physiology (1), and Journal of Life Sciences (2) Head of UNL Biosafety Committee; September 1994-January 2003
- currently serve on 12 graduate supervisory committees (11 PhD students and 1 MS students)
- Assistant Director of the Nebraska Center for Virology; November 2002-present

•Selected to be a Panel Manager for the USDA Pathogen Biology Section (mechanisms of disease, basic cellular &molecular biology, processes critical to infection initiation) (10/1/2003-9/30/2003)

▸Kelling, Clayton L.

•Chair (2000-01), Member (1996-02, 2003-06), Peer Review Committee
•Chair (2000-01), Member (1996-02, 2003-06), Promotion and Tenure Committee
•Member, Board of Scientific Reviewers, AVMA, *AJVR*
•Reviewer for *AJVR*, *Vaccine*
•Member (1993-present), VBMS Curriculum Committee
•Member (2003-06), CASNR Curriculum Committee

▸Lou, Marjorie F.

•Co-chair on Life and Death of Lens Cells session. Association for Research in Vision and Ophthalmology, Fort Lauderdale, FL, May 4-8, 2003
•Organizer and chair for the first minisymposium for Redox Biology Center, Lincoln, NE, September 11, 2003
•Chairman of the Program Committee for Lens Research, the European Vision and Eye Research Conference at Alicante, Spain, October 7-11, 2003. Reviewed 45 abstracts and programmed for the conference
•Co-chair, Lens Biochemistry Session, the European Vision and Eye Research Conference at Alicante, Spain, October 7-11, 2003
•Co-organizer, Abe Spector International Symposium, October 12-13, 2003
•Co-chair, Oxidative stress and cataract session, Abe Spector International Symposium, October 12-13, 2003

▸Moxley, Rodney A.

•Editorial Board, *Infection and Immunity*, American Society for Microbiology Press. 1/1/02-12/31/04
•Ad hoc reviewer, *Applied and Environmental Microbiology*, American Society for Microbiology Press 2003
•Ad hoc reviewer, USDA-CSREES-NRICGP, Area 44.0 Sustaining Animal Health and Well-Being, 2003
•Ad hoc reviewer, USDA-CSREES-NRICGP, Area 32.0 Food Safety, Ad hoc reviewer, 2003
•Ad hoc reviewer, University of Idaho, Research Grants Program
•Nebraska Station Representative, USDA-CSREES Multi-State Research Technical Committee, NC-1007 Enteric Diseases of Swine and Cattle: Prevention, Control and Food Safety, 10/1/02-9/30/07
•Member, UNL Institutional Biosafety Committee, 1/27/03-12/31/05
•Member, Curriculum Committee, UNL Department of Veterinary & Biomedical Sciences, 9/1/02-8/31/04. Chair, 1/1/03-8/31/04
•Member, Curriculum Committee, UNL, College of Agricultural Sciences and Natural Resources, 8/1/01-7/31/03
•Member & Chair, Peer Review Committee, Department of Veterinary & Biomedical Sciences, 10/1/02-9/30/04

•Member, CASNR Faculty Advisory Council, 7/1/03-6/30/05
•Member, St. Elizabeth Regional Medical Center Research Council, 9/03-7/06

▸Osorio, Fernando A.

•International Veterinary Advisory Board, Pig Improvement Corporation, 2001-
•Ad-Hoc reviewer for Journal of Virology, Virology, J. Clinical Microbiology and J. of Virological Methods
•Chair, Diagnostic Virology Committee, American Association of Veterinary Laboratory Diagnosticians, 2000-2003
•Nebraska representative to the NC-229(PRRSV Research) Multi-State Project

▸Pattnaik, Asit K.

•Ad hoc reviewer, Experimental Virology Study Section, NIH, October 2002
•Member, Special Study Section, Bio-terrorism and Emerging Viruses, NIH, July 2003
•Reviewed manuscripts submitted for publication in J. Virol., Proc. Natl. Acad. Sci., USA

▸Rogers, Douglas G.

•American Association of Veterinary Laboratory Diagnosticians:
- Committee on Enteric Diseases
•Nebraska Veterinary Medical Association:
- Professional & Consumer Relations Committee
- NVMA Student Scholarship Committee

▸Rupp, Gary P

•Nebraska College of Technical Agriculture Advisory Committee
- South Central Cattleman, Board of Directors
- KSU Food Animal Task Force Committee
- Journal of Theriogenology Ad Hoc Reviewer
- Nebraska Veterinary Student Selection Committee
- National Cattlemen's Beef Association - Production Research Committee

▸Smith, David R.

•Ad hoc reviewer: USDA CSREES NRI Competitive Grants Program, 2003
- 32.1 Epidemiology of Food Safety
•President, American Association of Extension Veterinarians, 2003
•Secretary, American Association of Extension Veterinarians, 1999-2003
•Secretary, Epidemiology Specialty, American College of Veterinary Preventive Medicine, 2002
•Food Safety Committee, American Association of Bovine Practitioners, 1999-present
•Co-manager, AABP-L listserve, American Association of Bovine Practitioners, 1999-present
- (1750+ subscribers from 60+ countries)
•Board of Directors, Nebraska State Dairymen's Association, 2000-present
•Nebraska Bureau of Animal Industry, Johne's Disease Advisory Committee, 1998-present
•Graduate Studies Committee, Dept. Veterinary and Biomedical Sciences, 2002-present
•Nominated to the Steering Committee on Antimicrobial Resistance, American Veterinary Medical Association

▸Srikumaran, Subramaniam

- •Member, National Institutes of Health Special Emphasis Panel, "Food and Water-borne Diseases Integrated Research Network", RFP-NIH-NIAID-DMID-03-04, February 26-28, 2003
- •Member, Review Panel on Animal Protection: Binational Agricultural Research and Development (BARD) Fund, 2003
- •Representative to the USDA NC-107 Regional Committee on Bovine Respiratory Diseases, from October 1988 to present
- •Member, Admissions Committee, Life Sciences Interdisciplinary Graduate Recruitment Program, 2001-present
- •Member, VBMS Graduate Committee, 1999-present
- •Member, VBMS Peer Review Committee, 2000-2003
- •Member, VBMS Curriculum Committee, 2000-present

▸Steffen, David J.

- •Departmental Peer Review Committee, 1996 elected 2000 – re-elected 2003
- •Social Committee 1997-2000, various search committees. Chair, poultry veterinarian search committee, microbiologist search committee 2002, curriculum committee, 2003-
- •Ad Hoc Reviewer for Vet Pathol., 1995-present
- •Associate Editor, Journal of Veterinary Diagnostic Investigations, 1996-present
- •AAVLD Pathology Committee, member 1991-present, chair, 1992-1995
- •By-Laws Committee Member 1997-2001, chair, 2002 -2005
- •Publications Committee 1998-present chair, 2001-2006
- •Program Committee, 2000-present
- •Director's Committee, 2000-present
- •ARDC Advisory Committee, 1997-1999
- •AVMA Sentinel Network, 2002-present

● Articles Regarding the Department in 2003 ●

"Intensive NU Research Expands Understanding of Dangerous E. coli," IANR News Service, January 3, 2003

"NU-Developed System Reduces Calf Scours and Associated Costs," IANR News Service, April 21, 2003

"Antibiotic Test is Another Tool for Food Safety Assurance," IANR News Service, April 21, 2003

"Poison Intentional, Cattle owner says," Online News Summaries, April 29, 2003

"West Nile Virus," Scarlet, May 8, 2003, pg 3A; Windsor Star in Canada, 2003; Halifax Daily News, 2003

"Best Production Through Knowledge Focus of 44th George Young Swine Conference," IANR News Service, July 23, 2003

"It Takes a Team," Beef Quality & Safety, Nebraska Cattleman, July/August, 2003, pg. 14

'PHAST' test your cattle, new screening tool checks for antibiotic traces, Nebraska Farmer, August 2003

"Eliminate the scourge of scours," Nebraska Farmer, September 2003, pg. 34

"Calving system hleps reduce calf scours," University of Nebraska-Lincoln Agricultural Research Division, Research Nebraska, September 2003, pg 17

"PHAST Relief for Allergy Sufferers," Nebraska Magazine, Fall 2003, pg 12

"A Fair-y Tale Beginning," (Nebraska State Fair), Daily Nebraskan, Vol. 103, Issue #6, August 29, 2003

"Understanding calf scours," (Part 1), Bovine Veterinarian, September 2003, pgs. 22-28

"Aflatoxin, Other Grain Molds Could Again Cause Problems Across the State," IANR News Service, September 29, 2003

"The Prevalence of Johne's Disease," Beef Quality & Safety, Nebraska Cattleman, October 2003, pg 10

"NU Research Shows Vaccine, Bacterial Feed Additive Reduce E. coli in Cattle," IANR News Service, October 21, 2003

"Diagnosing and Treating Calf Scours," (Part 2), Bovine Veterinarian, October 2003, pgs 4-8

"Calving System Helps Reduce Calf Scours," Drovers, October 2003, pg 16

"Nebraska State Fair Birthing Pavilion," Nebraska Veterinary Views (Nebraska Veterinary Medical Association), September/October 2003, pgs 6-7

"Battling Bacteria: New Cattle Vaccine May Kill E. coli," Lincoln Journal Star, October 22, 2003, pg 1B-4B

"Vaccine, Feed Additive Reduces E. coli in Cattle," Feedstuffs, November 3, 2003, Vol. 75, #45, pgs 1 & 4

"Research: Vaccine, Additive Cut E. coli," Scarlet, November 6, 2003, pgs. 1 & 4

"Veterinary Task Force Created," Scarlet, November 6, 2003, pg 2

"NU E. coli Research Featured on November 15 Market Journal," IANR News Service, November 7, 2003

● Departmental Budget Summaries ●
Department of Veterinary and Biomedical Sciences

Table 9. Budget, Veterinary and Biomedical Sciences Department – Fiscal Year 2003

FY Budget	FTE*	Personnel	Benefits	Operating	Totals
Research	53.1	2,673,191	558,909	176,899	3,408,999
Teaching	9.12	481,506	93,683	94,021	669,210
Extension	3.69	224,371	59,805	27,937	312,113
TOTAL		**3,379,068**	**712,397**	**298,857**	**4,390,322**

*Includes faculty and staff

Table 10. Summary of Other Income*

Source of Income	Amounts
Animal Health Funds	107,456
Regional Research Funds	52,500
Tobacco Research Funds	
Grants Received	2,497,768
Research Revolving Income	291,609
Teaching Revolving Income	9,621
Extension Revolving Income	12,325
Diagnostic Revolving Income	1,422,876
Biotechnology Support	
TOTAL	**4,394,155**

*Includes AOC funds

Table 11. Nebraska Veterinary Diagnostic Laboratory System Revolving Account Summary for FY 2003

LINCOLN DIAGNOSTIC LAB (VDC)			
Income	Personnel Expense	Operating Expense	Balance
1,959,776	173,337	572,706	1,213,733

Table 12. Summary of Research Funds* Allocations to Veterinary and Biomedical Sciences Department by Agricultural Research Division for Fiscal Year 2003 and Comparison to Average for 20 IANR Administrative Units**

Characteristics	Veterinary & Biomedical Sciences	ARD Average
Faculty Research FTE	9.30	6.55
Faculty Salary, $/FTE	103,951	89,093
Managerial/Professional Employee, fte/FTE	0.40	0.68
Managerial/Professional Salary, $/FTE	16,899	24,891
Office/Service Employee, fte/FTE	0.81	0.73
Office/Service Salary, $/FTE	19,794	20,903
GRA Stipends, $/FTE	19,045	13,855
Hourly Employee Wages, $/FTE	845	1,728
Fringe Benefits, $/FTE	32,570	31,415
Operating, $/FTE	30,993	21,506
Total Support, $/FTE	120,146	114,298
Total Investment, $/FTE	**224,097**	**203,391**

* Summary includes State, Hatch, Federal Animal Health Research Formula Funds, (Section 1433) and USDA CSRS North Central Regional Research Funds. Does not include revolving, grant and contract funds or Veterinary Diagnostic Center or Great Plains Veterinary Educational Center budgets.

** Data compiled by IANR Agricultural Research Division.

Table 13. Veterinary and Biomedical Sciences Unit Performance Characteristics[1]

UNIT PERFORMANCE CHARACTERISTICS

VETERINARY & BIOMEDICAL SCIENCES UNIT PERFORMANCE CHARACTERISTICS[1]

Characteristic	FY 2002		Average of FY 2000-2002	
	VBS	ARD Ave.	VBS	ARD Ave.
Total Approp. $/FTE[2]	204,596	199,890	194,678	193,724
Ref. Publications/FTE[3]	1.60	4.09	2.09	3.90
Theses/FTE[4]	0.66	1.00	0.65	0.92
Competitive Grant $/FTE	181,123	80,575	168,014	67,039
Total Grant $/FTE[5]	232,717	140,142	219,481	123,263
Total Grant $/Total Approp. $	1.137	0.733	1.127	0.636
Compet. Grant Proposals/FTE	2.44	1.47	1.91	1.17
Total Grant Proposals/FTE	7.04	10.51	7.03	9.51
Total Resources, $/FTE	**437,313**	**340,032**	**414,159**	**316,987**

1 Data taken from ARD budgets, ARD Annual Reports and Summary of grants prepared by Office of Sponsored Programs.

2 Data reflects Unit appropriated budget plus RRF, McIntire Stennis, Animal Health and funds added to unit during fiscal year.

3 Publications included journal articles, book, book chapters and research bulletins.

4 Theses include MS theses and PhD dissertations

5 Includes proposals to all funding agencies (federal and state agencies, commodity boards, UN Foundations, corporations and internal grant proposals).

Table 14. RESOURCE AND PERFORMANCE TRENDS

UNIT: VETERINARY & BIOMEDICAL SCIENCES

(INCLUDES GPVEC)

FISCAL YEAR

INDICATOR	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Research FTE	8.58	9.13	8.98	7.55	7.81	7.41	5.46	6.96	8.93	10.88	10.88	10.65	9.30
Approp. $/FTE 1/	148,003	147,671	156,233	197,394	194,459	211,145	281,495	239,044	189,151	184,216	195,222	204,596	224,097
Comp. Grant $/FTE	111,752	33,954	33,686	56,131	92,978	165,027	131,558	133,955	102,289	93,830	229,038	181,123	
Total Grant $/FTE	146,092	64,891	54,003	94,388	164,400	250,806	241,423	229,064	133,224	160,688	265,037	232,717	
Grant $/Approp. $	0.987	0.439	0.346	0.478	1.92	1.188	0.858	9.958	0.704	0.87	1.358	1.137	
Total Resources, $/FTE	294,095	212,562	210,236	291,782	358,859	462,011	522,918	468,108	322,375	344,904	460,259	437,313	
Ref. Pubs/FTE	0.93	2.52	2.44	3.18	2.56	2.29	2.56	3.45	2.58	1.19	3.48	1.60	
Theses/FTE	0.23	0.11	1.34	0.93	1.28	1.35	2.20	1.44	0.90	0.92	0.37	0.66	
Comp. Proposals/FTE 2/	2	1.64	1.78	2.91	1.92	1.21	1.47	1.72	1.90	1.65	1.65	2.44	
Total Proposals/FTE 3/	**9.51**	**9.85**	**9.69**	**12.32**	**9.35**	**8.50**	**9.34**	**4.89**	**8.40**	**7.17**	6.89	7.04	

1/Includes state and federal formula funds plus additional resources added to units on a nonrecurring basis. Does not include administrative "overhead," diagnostic laboratories, or general support of ARDC or interdisciplinary centers.
2/Proposals submitted to federal agencies with competitive grant programs.
3/All grant proposals including those submitted to commodity boards, industry and university internal grant competition.

Table 15. Research Grant and Contract Income During the Last Four Calendar Years Expressed on Dollars Per Research FTE Basis*

Unit	1999	2000	2001	2002	Average 1999-2002
Agricultural Economics	24,511	19,958	12,903	19,490	19,216
Ag Leadership, Ed & Comm**	-0-	-0-	8,381	-0-	2,095
Agronomy & Horticulture	98,633	126,409	166,655	103,434	123,783
Animal Science	61,589	146,076	139,655	114,218	115,385
Biochemistry	344,416	215,232	292,905	462,158	328,678
Biological Systems Engineering	41,638	91,986	141,065	61,571	84,065
Biometry	36,569	12,539	1,101	63,515	28,431
Entomology	125,557	100,837	123,257	133,919	120,893
Family & Consumer Science	602	-0-	14,021	-0-	3,656
Food Science & Technology	355,539	556,265	381,421	538,807	458,008
Northeast R&E Center	45,018	48,272	54,760	49,595	49,411
Nutritional Science & Dietetics	9,766	8,127	248,501	72,187	84,645
Panhandle R&E Center	134,992	119,762	104,646	128,767	122,042
Plant Pathology	126,765	192,602	164,151	173,741	164,315
School of Natural Resources Science**	266,917	295,943	407,086	224,001	298,486
South Central R&E Center	67,085	73,734	81,201	47,958	67,495
Textiles, Clothing & Design	-0-	1,288	127,103	67,578	48,992
Veterinary & Biomedical Sciences	161,627	274,453	100,924	337,777	218,695
West Central R&E Center	37,583	21,568	48,050	49,996	39,299
AVERAGE	**106,232**	**119,033**	**137,778**	**139,406**	**125,136**

* Grants obtained by interdisciplinary center and the ARD Dean's office are not listed. These funds are largely expended by faculty in academic units. Therefore, the listing is not a completely accurate representation of all external funds available for faculty use.

** Included in listing for the first time in CY 1998.

Table 16. Nebraska Cash Receipts* from Farm Marketings by Commodity, 2002**
Total All Commodities = $9,588,658

LIVESTOCK PRODUCTS			CROPS		
Commodity	$ Value in Thousands	% of Total	Commodity	% Value in Thousands	% of Total
Livestock & Products	5,824,295	60.7	Food Grains	179,924	***
Meat Animals	5,552,104	***	Rye	***	***
Cattle & Calves	4,958,569	51.7	Wheat	171,072	1.8
Hogs	584,369	6.1	Millet, Proso	8,483	0.1
Sheep & Lambs	9,166	0.1	Feed Crops	2,433,175	***
Dairy Products	141,154	1.5	Oats	2,189	0.0
Milk, Wholesale	141,154	***	Barley	450	0.0
Poultry & Eggs	111,533	***	Corn	2,251,625	23.5
Broilers	6,210	0.1	Hay	133,022	1.4
Farm Chickens	18	0.0	Sorghum Grain	45,889	0.5
Chicken Eggs	84,596	0.9	Oil Crops	948,539	***
Other Poultry	880	***	Soybeans	944,489	9.9
Misc. Livestock	19,504	***	Sunflower	***	***
Honey	4,676	0.0	Vegetables	121,161	***
Wool	183	0.0	Dry Edible Beans	65,615	0.7
Other Livestock	14,300	***	Potatoes	48,246	0.5
Crops	3,764,363	39.3	Summer	***	***
Other Berries	70	0.0	Fall	48,246	***
Other Seeds	1,000	0.0	Misc. Vegetables	7,300	***
Fruits & Nuts	720	0.0	Greenhouse/nursery	21,800	0.2
Misc Fruits & Nuts	650	0.0	All Other Crops	80,844	***
Sugar Beets	28,044	0.3			
Other Field Crops	30,000	***			

* Data from ERS/Economic Research Service/USDA
** Most current data available
*** Data not available

Table 17. Nebraska - Rank in Agriculture (2003)*

Rank	
1st	Commercial livestock slaughter, live weight, 2002 - 11,971,343,000 *lbs*
1st	Commercial red meat production, 2002 - 7,598,900,000 *lbs*
1st	Commercial cattle slaughter, live weight, 2002 - 10,143,727 *lbs*
1st	Commercial cattle slaughter, number, 2002 - 7,861,900 *head*
1st	Great northern bean production, 2002 - 1,286,000 *Cwt*
1st	Light red kidney bean production, 2002 - 315,000 *Cwt*
2nd	Cash receipts from all meat animals, 2001 - $5,786,713 *Dollars*
2nd	Cash receipts from cattle and calves, 2001 - $5,066,786 *Dollars*
2nd	All cattle on feed, January 1, 2003 - 2,260,000 *Head*
2nd	Pinto beans production, 2002 - 1,709,000 *Cwt*
3rd	All dry edible beans production, 2002 - 3,465,000 *Cwt*
3rd	Cash receipts from all feed crops, 2001 - 2,150,092,000 *Dollars*
3rd	All cattle and calves, January 1, 2003 - 6,200,000 *Head*
3rd	Total value of all cattle and calves, January 1, 2003 - 4,464,000,000
3rd	Fed cattle and calves marketed (1,000+capacity lots), 2002 - 4,610,000 *Head*
3rd	Proso millet production, 2002 - 845,000 *Bushels*
3rd	Cash receipts from corn, 2001 - 1,950,635,000 *Dollars*
3rd	Cash receipts from sorghum grain, 2001 - 61,905,000 *Dollars*
3rd	Cash receipts from livestock and livestock products, 2001 - 6,086,231,000 *Dollars*
4th	Corn for grain production, 2002 - 940,800,000 *Bushels*
4th	Beef cows and heifers that have calved, January 1, 2003 - 1,934,000 *Head*
4th	Land in farms and ranches, 2002 - 46,400,000 *Acres*
4th	On-farm grain storage capacity, December 1, 2002 - 970,000,000 *Bushels*
4th	Cash receipts from farm marketings, 2001 - 9,488,580,000 *Dollars*
4th	Off-farm grain storage capacity, December 1, 2002 - 690,405,000 *Bushels*
5th	Sorghum for grain production, 2002 - 15,000,000 *Bushels*
5th	Soybean production, 2002 - 176,330,000 *Bushels*
5th	Sorghum silage production, 2002 - 188,000 *Tons*
5th	Cash receipts from hogs and pigs, 2001 - 711,323,000
5th	Commercial hog slaughter, live weight, 2002 - 1,827,457,000 *lbs*

Rank	
5th	Cash receipts from soybeans, 2001 - 887,188,000 *Dollars*
5th	Cash receipts from all oil crops, 2001 - 894,410,000 *Dollars*
5th	All hogs and pigs, December 1, 2002 - 2,950,000 *Head*
6th	Value of principal crops produced, 2002 - 4,086,920,000 *Dollars*
6th	Alfalfa hay production, 2002 - 4,050,000 *Tons*
6th	Commercial hog slaughter, number, 2002 - 6,944,700 *Head*
6th	Calves born, 2002 - 1,820,000 *Head*
6th	Value of all hogs and pigs on farms, December 1, 2002 - 217,500,000 *Dollars*
6th	All hay production, 2002 - 5,950,000 *Tons*
7th	Sunflower production, 2002 - 24,7000,000 *lbs*
7th	Harvested acreage, principal crops, 2002 - 17,899,000 *Acres*
7th	Winter wheat production, 2002 - 48,640,000 *Bushels*
7th	Pigs saved, 2002 - 6,095,000 *Head*
7th	Net farm income, 2001 - 1,610,282,000 *Dollars*
8th	Corn silage production, 2002 - 4,513,000 *Tons*
8th	Sugarbeet production, 2002 - 760,000 *Tons*
8th	Cash receipts from crops, 2001 - 3,402,349,000 *Dollars*
8th	Cash receipts from sugarbeets, 2001 - 24,528,000 *Dollars*
8th	Table eggs produced, December 1, 2001-November 30, 2002 - 2,977,000,000 *Eggs*
10th	All wheat production, 2002 - 48,640,000 *Bushels*
11th	Cash receipts from wheat, 2001 - 164,324,000 *Dollars*
11th	Other hay (excludes alfalfa) production, 2002 - 1,900,000 *Tons*
12th	All potato production, 2002 - 8,611,000 *Cwt*
12th	All chickens, December 1, 2002 - 13,679,000 *Head*
13th	Cash receipts from potatoes, 2001 - 51,457,000 *Dollars*
13th	Cash receipts from all food grains, 2001 - 175,778,000 *Dollars*
13th	Cash receipts from hay, 2001 - 135,499,000 *Dollars*
14th	Value of all chickens on hand, December 1, 2002 - 24,622,000 *Dollars*
14th	Cash receipts from chicken eggs, 2001 - 95,532,000 *Dollars*
14th	Honey production, 2002 - 3,225,000 *lbs*
16th	Oats production, 2002 - 2,365,000 *Bushels*

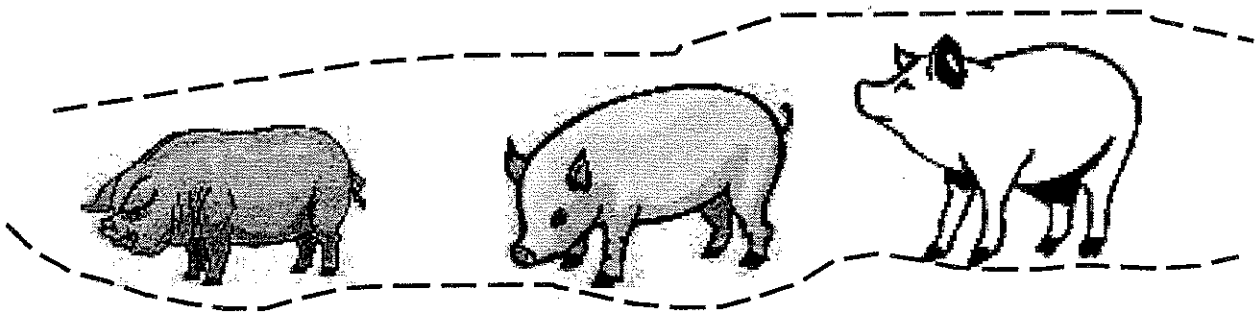
Rank	
16th	Number of farms, 2002 - 52,000 *Farms*
16th	Wool production, 2002 - 610,000 *lbs*
16th	Value of wool production, 2002 - 183,000 *Dollars*
18th	All sheep and lambs, January 1, 2003 - 89,000 *Dollars*
26th	Barley production, 2002 - 215,000 *Bushels*

***Data from the Nebraska Agricultural Statistics Service (NASS), Lincoln, NE**

● Appendix ●

1) The Second Governor's Conference on Ensuring Meat Safety: *E. coli* O157:H7 Progress & Challenges, Embassy Suites Hotel, Lincoln, Nebraska

2) The 44th Annual George A. Young Swine Health and Management Conference, Lincoln, Nebraska



Scheduled Speakers

Andy Benson, Department of Food Science and Technology, University of Nebraska, Lincoln, NE

Tom Besser, Department of Veterinary Microbiology, Washington State University, Pullman, WA

Fred Blattner, Department of Genetics, University of Wisconsin, Madison, WI

Mindy Brashears, Department of Animal Science and Food Sciences, Texas Tech University, Lubbock, TX

James Dickson, Department of Microbiology, Iowa State University, Ames, IA

Mike Doyle, Center for Food Safety, University of Georgia, Griffin, GA

Brett Finlay, Departments of Biochemistry and Molecular Biology and Microbiology and Immunology, University of British Columbia, Vancouver, Canada

Mike Johanns, Governor of Nebraska

James Kaper, Center for Vaccine Development, University of Maryland School of Medicine, Baltimore, MD

Charles Kasper, Department of Food Science, University of Wisconsin, Madison, WI

James Keen, Animal Health Research Unit, U.S. Meat Animal Research Center, Clay Center, NE

Rod Moxley, Department of Veterinary and Biomedical Sciences, University of Nebraska, Lincoln, NE

Elsa Murano, USDA Under Secretary for Food Safety, Washington, D.C.

Alison O'Brien, Department of Microbiology, Uniformed Services University of the Health Sciences, Bethesda, MD

Harvey Perlman, Chancellor, University of Nebraska–Lincoln Lincoln, NE

David Smith, Department of Veterinary and Biomedical Sciences, University of Nebraska, Lincoln, NE

Phil Tarr, Departments of Pediatrics and Microbiology, University of Washington School of Medicine, Seattle, WA

Steve Taylor, Department of Food Science and Technology, University of Nebraska, Lincoln, NE

Bruce Tompkin, Vice President for Food Safety, ConAgra Foods, Omaha, NE

University of Nebraska Lincoln | Department of Food Science and Technology

E. coli Conference
c/o Pauline Galloway
PO Box 830919
Lincoln, NE 68583-0919

The Second Governor's Conference on Ensuring Meat Safety:

E. coli O157:H7 Progress & Challenges

April 7-8, 2003

Embassy Suites Hotel, Lincoln, Nebraska

University of Nebraska Lincoln

Sponsored by:
United States Department of Agriculture
University of Nebraska Institute of Agriculture and Natural Resources
University of Nebraska–Lincoln Department of Food Science and Technology

Ensuring Meat Safety

Program Highlights:

Evolution, genetics and ecology of *E. coli* O157
On-farm strategies for controlling *E. coli* O157
Processing strategies for controlling *E. coli* O157

Who Should Attend?

Researchers from academia
Students in microbiology, veterinary, animal and food sciences
Industry representatives
Government officials
Individuals representing cattle producers and meat processors

Poster Session:

A poster session will be held on Monday afternoon, April 7. Students are encouraged to submit abstracts that fall within the conference theme. Abstracts may only be submitted electronically by March 17, 2003.

Website:

To submit abstracts, to register on-line, to view speaker information, and for other conference details, please visit our website at ***www.ecoliconference.unl.edu***

If you have any questions, please contact Pauline Galloway at 402-472-9751 or pgalloway2@unl.edu.

Co-Sponsors:
State of Nebraska
Nebraska Department of Agriculture
University of Nebraska–Lincoln Food Processing Center
American Society for Microbiology Missouri Valley Branch
University of Nebraska Microbiology Initiative
Alliance for Food Protection
Nebraska Cattlemen
Nebraska Farm-to-Table Food Safety Initiative
Nebraska Association of Meat Processors
Institute of Food Technologists - Alsarben Section

PROGRAM

Monday, April 7, 2003

7:30 - 8:30 am
Registration and Reception

8:30 - 9:00 am
Welcome and Introduction
Mike Johanns, Governor of Nebraska

Harvey Perlman, Chancellor, University of Nebraska–Lincoln Lincoln, NE

Steve Taylor, Department of Food Science and Technology, University of Nebraska–Lincoln Lincoln, NE

9:00 - 12:15 pm
Session 1: Pathogenesis and epidemiology of *E. coli* O157:H7

Alison O'Brien
Intimin & Shiga toxins: sticking around and causing trouble

Phil Tarr
Pathophysiology of childhood E. coli O157:H7 infections

10:30 - 10:45 am
Coffee Break

James Kaper
The locus of enterocyte effacement: An overview of its virulence factors, regulation, quorum sensing, and role in disease

Brett Finlay
Pathogenic E. coli O157: from molecules to vaccines

12:15 - 1:30 pm
Lunch

1:30 - 2:15 pm
Keynote Lecture
Elsa Murano, USDA Under Secretary for Food Safety, Washington, D.C.
Update on U.S. food safety policy

2:15 - 4:30 pm
Session 2: Genetics, evolution and ecology of *E. coli* O157:H7

Fred Blattner
The genomics of E. coli O157:H7 and related pathogenic bacteria

Andy Benson
Genome changes and emergence of contemporary E. coli O157:H7 populations

Tom Besser
Lessons from the rear-view mirror: ten years of research on the ecology of E. coli O157:H7

4:30 - 6:00 pm
Poster Session

6:00 pm
Adjourn

Tuesday, April 8, 2003

8:00 - 8:30 am
Reception

8:30 - 10:30 am
Session 3: On farm epidemiology of *E. coli* O157: H7

James E. Keen
STEC O157 in livestock: changing technologies, revised on-farm epidemiology

Charles Kaspar
Linking E. coli O157:H7 clonal turnover with possible control strategies

David Smith
Feedlot epidemiology of E. coli O157:H7: bridging the gaps

10:30 - 10:45 am
Coffee Break

10:45 - 12:15 pm
Session 4: On-farm strategies for controlling *E. coli* O157:H7

Mike Doyle
Efficacy of E. coli isolates in reducing carriage of E. coli O157:H7 by cattle

Rod Moxley
Comparison of the efficacy of vaccination and probiotic feeding for reducing the prevalence of E. coli O157:H7 in feedlot cattle

12:15 - 1:30 pm
Lunch

1:30 - 3:30 pm
Session 5: Post-harvest strategies for controlling *E. coli* O157:H7

Mindy Brashears
Pre-and post-harvest strategies to reduce E. coli O157:H7 in the food supply

James Dickson
Irradiation inactivation of E. coli O157:H7

Bruce Tompkin
Strategies to achieve improved control and consumer protection

3:30 - 4:30 pm
Forum on research and training needs to combat *E. coli* O157:H7
(Speakers from the food processing and food production industries.)

4:30 pm
Re-cap and adjourn

When:
Monday, April 7, 2003 and Tuesday, April 8, 2003

Where:
Embassy Suites Hotel
1040 P Street
Lincoln, NE 68508
402-474-1111

Cost:
$75

Registration deadline: Monday, March 17, 2003. The registration fee includes a continental breakfast, coffee breaks and lunch each day. Registration fees are waived for students who register by March 17, 2003.

Registration:
To register for the Second Governor's Conference on Ensuring Meat Safety, please complete the attached registration form and return with payment by Monday, March 17, 2003. The registration fee is refundable only if the conference is filled or canceled. No refunds will be given if your attendance is not possible (substitutions are acceptable). Check should be made payable to the University of Nebraska–Lincoln.

Hotel Reservations:
Participants are required to make their own lodging arrangements. Please contact the following hotels for room availability and mention the *E. coli* conference when placing your reservation.

Embassy Suites Hotel
1040 P Street
Lincoln, NE 68508
402-474-1111
800-362-2779
Rates are $104.00 per night. Shuttle service is provided to and from the airport.

Holiday Inn Downtown
141 North 9th Street
Lincoln, NE 68508
402-475-4011
Rates are $79.00 per night until March 7, 2003. Shuttle service is provided to and from the airport.

Parking:
Parking is included in the registration fee and details will be mailed to you with the registration confirmation letter.

Registration Form:

Please register me for the Second Governor's Conference on Ensuring Meat Safety: *E. coli* O157:H7 - Progress and Challenges, April 7-8, 2003, at the Embassy Suites in Lincoln, Nebraska. The registration fee is $75. Registration is also available on-line at www.ecoliconference.unl.edu

Payment Options:

____ Enclosed is a check made payable to the University of Nebraska–Lincoln.

Charge my: ____VISA ____MasterCard

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(required if using credit card)

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____ Check here if you require special meals.

Return this form and your payment to:

University of Nebraska–Lincoln
Pauline Galloway
143 Food Industry Complex
PO Box 830919
Lincoln, NE 68583-0919

Phone: 402-472-9751
Fax: 402-472-1693
E-mail: pgalloway2@unl.edu

THE 44TH ANNUAL GEORGE A. YOUNG SWINE HEALTH AND MANAGEMENT CONFERENCE

August 15, 2003

"Achieving the Best of Production Through Knowledge"

University of Nebraska
Cornhusker Hotel, Lincoln — Downtown
333 South 13th Street
Lincoln, NE

- Swine Industry Economics
- Swine Diseases
- Production and Management Strategies

University of Nebraska Lincoln

Sponsors

University of Nebraska–Lincoln
Institute of Agriculture and Natural Resources
Nebraska Cooperative Extension

Department of Veterinary and Biomedical Sciences

PROGRAM

7:30	Registration *(with coffee and rolls)*
Welcome	*Dr. Bruce Brodersen, Conference Chair*
8:00 - 8:45	"Pros and Cons of Country of Origin Labeling Legislation" — *Dr. Darrell Mark*
8:45 - 9:15	"Logistics of Country of Origin Legislation for Producers" — *Mr. Jon Caspers*
9:15 - 10:15	"Packer Ownership of Hogs" — *Dr. Ronald Plain*
10:15-10:30	BREAK
10:30 - 12:00	"Relationships Between Swine Nutrition and Whole Farm Nutrient Management Issues" — *Dr. Duane Reese and Dr. Rick Koelsch*
12:00	LUNCH — "Pseudorabies Eradication Program" — *Dr. Ron Brodersen, Hartington, NE; American Association of Swine Veterinarians' Swine Practitioner of the Year*
1:30 - 2:00	"Antimicrobial Use in Swine Production - Is the Danish Model Our Future?" — *Dr. John Waddell*
2:00 - 2:30	"A Practitioner's Perspective on Controlling PRRS in PRCD" — *Dr. Joseph Connor*
2:30 - 3:00	"Swine Influenza as a Factor in PRDC" — *Dr. Bruce Janke*
3:00 - 3:30	"*Mycoplasma hyopneumoniae* as a factor in PRDC" — *Dr. Eileen Thacker*
3:30 - 4:00	Panel of afternoon speakers to answer questions

The Conference has been approved for 6 hours of Nebraska Veterinary Continuing Education credits.

INTRODUCTION

Pork producers, large animal and swine practitioners, faculty in the animal and veterinary sciences, and industry representatives will benefit from this update of research and industry developments as they relate to modern swine production and technology.

The George A. Young Swine Conference has a long-standing tradition of providing up-to-date information on developments in research and production techniques as they relate to today's swine industry. Industry experts have come to respect this conference as their annual opportunity to communicate with colleagues, and to interact with others throughout the spectrum of swine research and production.

GUEST PARTICIPANTS

Mr. Jon Caspers — President, National Pork Producers Council
Dr. Joseph Connor — Carthage Veterinary Services, Carthage, Illinois
Dr. Ron Brodersen — Whole Hog Health Center, Hartington, NE
Dr. Bruce Janke — Associate Professor; Departments of Veterinary Pathology and Veterinary Diagnostic & Production Animal Medicine; Iowa State University; Ames, Iowa
Dr. Ronald Plain — Professor of Agricultural Economics; University of Missouri; Columbia, Missouri
Dr. Eileen Thacker — Assistant Professor; Department of Veterinary Microbiology & Preventive Medicine; Iowa State University; Ames, Iowa
Dr. John Waddell — Sutton Veterinary Clinic; Sutton Nebraska

INSTITUTE OF AGRICULTURE AND NATURAL RESOURCES (IANR) PROGRAM PARTICIPANTS

Bruce Brodersen — Dept. of Veterinary & Biomedical Sciences, Veterinary Diagnostic Center, Univ. of Nebraska; Lincoln, Nebraska
Darrell Mark — Department of Agricultural Economics, University of Nebraska; Lincoln, Nebraska
Duane Reese — Swine Nutritionist, Animal Science Department, University of Nebraska; Lincoln, Nebraska
Rick Koelsch — Livestock Environmental Engineer, Department of Biological Systems Engineering, Univ. of Nebraska; Lincoln, Nebraska

PROGRAM COMMITTEE

Bruce Brodersen, Chair; Sharon Clowser, Conference Coordinator; Tom Buelt, Pfizer Animal Health; Dave Ellis, Elanco Animal Health; Larry Germer; Gage County Extension Educator; Phil Hardenburger, Crete Veterinary Clinic; Mike Brumm, Univ. of NE Haskell Agricultural Laboratory; Alden Zuhlke, Producer; Jeff Huss, Boehringer Ingelheim Vetmedica, Inc.; Jim Unwin, Red Barn Veterinary Clinic

PROGRAM OVERVIEW

"Pros and Cons of Country of Origin Labeling Legislation" — Dr. Darrell Mark

This presentation will summarize recent estimates of the impact of Country of Origin Labeling (COOL), which was created with the passage of the 2002 Farm Bill. Potential advantages and disadvantages of the legislation will be discussed, along with a review of how USDA intends to implement the regulations for mandatory COOL that are expected to be in place by September 30, 2004. The possible effects on retail and live hog prices, U.S. live hog and pork imports and exports, and structural changes in the pork industry will also be addressed.

"Logistics of Country of Origin Legislation for Producers" — Mr. Jon Caspers, President, National Pork Producers Council

As the time nears for implementation of Country of Origin Legislation (COOL), there are many unanswered questions on how to comply with this legislation. Some mechanisms have been proposed such as traceback procedures and strict segregation of foreign-born animals. An alternative to traceback would be to allow each participant in the marketing channel to certify the product comes only from animals of U.S. sources.

"Packer Ownership of Hogs" — Dr. Ronald Plain

Hog packers are raising an ever-growing share of the nation's hogs. Five of the nine largest U.S. hog producers are also hog packers. Packers account for a quarter of U.S. hog production. The integration of production and packing has many wondering about the future of independent producers.

"Relationships Between Swine Nutrition and Whole Farm Nutrient Management Issues" — Dr. Duane Reese and Dr. Richard Koelsch

Environmental issues in agriculture represents a significant challenge to the pork industry. The relationships between swine nutrition and whole farm nutrient management issues will be demonstrated using a case farm. The latest technologies on how to alter the phosphorus and nitrogen content of swine manure produced on the case farm will be presented. This will be followed by a demonstration designed to show how much the altered manure affects land base requirements and the rate of soil phosphorus accumulation on the farm.

"Pseudorabies Eradication Program" — Dr. Ron Bredenes

The noon luncheon speaker is using this opportunity to recognize those who have contributed to eradication of pseudorabies (PRV) from Nebraska. Nebraska's efforts to eradicate PRV has been the result of a combined effort of people from diverse areas, including private sector, institutional, and governmental agencies. There will be a brief review of some of the history / milestones of PRV and its presence in Nebraska.

"Antimicrobial Use in Swine Production — Is the Danish Model Our Future?" — Dr. John Waddell

Antimicrobials have been a valuable tool in swine production for several decades. Recently, antimicrobial use in food production has come under increased scrutiny due to fears of resistance development in human pathogens. This scrutiny has been especially acute in Europe. Denmark has been at the forefront of antimicrobial use in swine production and has enacted strict new regulations to control their use. This presentation will review the Danish system and ponder the possibility of similar restrictions and their effect on how we produce pork in the U.S.

"A Practitioner's Perspective on Controlling PRRS in PRCD" — Dr. Joseph F. Connor

PRRS is an active participant in PRDC. Strategies to minimize performance reduction include; natural exposure, natural plus vaccine exposure, parity flow, and elimination. Each strategy is coupled with diagnostic profiling to maintain discipline for success.

"Swine Influenza as a Factor in PRDC" — Dr. Bruce H. Janke

This presentation will use case submission information from the Iowa State University Veterinary Diagnostic Laboratory database to illustrate the role of SIV in swine pneumonia relative to other respiratory pathogens. Dr. Janke will provide an update of the latest information on reassortants and variants of SIV currently circulating in the U.S. swine population and the significance of these variations.

"*Mycoplasma hyopneumoniae* as a Factor in PRDC" — Dr. Eileen Thacker

Mycoplasma hyopneumoniae, the cause of enzootic pneumonia, continues to be a problem for swine practitioners and producers. Dr. Thacker will discuss current research about both the pathogen itself as well as the role it plays in interacting with other pathogens associated with the porcine respiratory disease complex (PRDC). Pathogenesis, diagnosis and control strategies will be discussed as well.

SPONSORS

We would like to thank the following sponsors for their support and contributions in making this Conference possible:

Alpharma Animal Health
Boehringer Ingelheim Vetmedica
Danbred North America
Elanco Animal Health
Fort Dodge Animal Health
Intervet, Inc.
Merial
Pfizer Animal Health
Phibro Animal Health

CANCELLATIONS

If you must cancel your registration, please notify us prior to August 1 in order to receive a full refund. Cancellations received after August 1 will be subject to an administrative charge of $10.00.

HOTEL RESERVATIONS

For those people needing hotel accommodations, a block of rooms has been reserved for the Conference at the Cornhusker, 333 South 13th St., Lincoln, NE. The rate for a single/double occupancy room is $91.00. To make your reservations, call 1-800-793-7474 or (402) 474-7474 and ask for rooms reserved for the George Young Swine Conference.

For further information, contact Sharon Clowser, Conference Coordinator, Department of Veterinary and Biomedical Sciences, 151 Veterinary Diagnostic Center, P.O. Box 830907, University of Nebraska–Lincoln, Lincoln, NE 68583-0907, phone 402/472-8550; FAX 402/472-3094; E-mail address: sclowser2@unl.edu

An additional attraction for attendees to the conference is the
7th Annual Nebraska Pork Producers
Capital City Ribfest
August 14-17, 2003
Downtown Lincoln, on "N" from 16th to Centennial Mall
and the grounds of Pershing Center.
http://www.pershingauditorium.com/ribfest/

GEORGE A. YOUNG SWINE HEALTH & MANAGEMENT CONFERENCE

Registration Form

Name_____

Address_____

City_____

State _____ Zip _____

Phone_____ Fax _____

Conference Fees:

_____	Pre-registration:	$65.00 per person
_____		$55.00 per person (Group of 3 or more)
_____	At the door:	$85.00

One Proceedings will be provided with each paid registration. Please check the one you prefer.

_____	Book	_____ CD
_____	Extra Proceedings—Book:	$20.00 at the door
_____		$35.00 by mail
_____	Extra Proceedings—CD	$10.00 at the door
_____		$25.00 by mail

Total Enclosed $_____

_____ Number of people attending luncheon.

Each registrant will receive a free admission ticket to Ribfest.

Registrations received after August 1, 2003 will be charged an additional $10.00.

Make checks payable to: University of Nebraska

Return this form to: University of Nebraska–Lincoln
George Young Conference Registration
Attn: Sharon Clowser
P.O. Box 830907
Lincoln, NE 68583-0907